

**Advanced  
Compliance Laboratory**

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**Electromagnetic  
Emission  
Compliance  
Test Report**



**Equipment Under Test  
(EUT)  
Applicant**

Digital Multi-Carrier Amplifier DMAU-U  
Andrew Corporation

**In Accordance With**

FCC Part 24, Subpart E

**Test by**

Advanced Compliance Laboratory, Inc.  
6 Randolph Way  
Hillsborough, New Jersey 08844

**Authorized by**

Wei Li  
Lab Manager

Signature

**Date**

June 16, 2005

**AC Lab Report  
Number**

0048-050606-01



Lab Code:200101-0

**The test result in this report is supported and  
covered by the NVLAP accreditation.**

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## Section 1. Summary of Test Results

Manufacturer: Andrew Corporation  
Model No.: Digital Multi-Carrier Amplifier DMAU-U  
Parts No.: RF100154

General: **All measurements are traceable to national standards**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 24, Subpart E.

☒ New Submission ☒ Production Unit  
☐ Class II Permissive Change ☐ Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

“See Summary of Test Data”



**NVLAP LAB CODE: 200101-0**

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**Summary of Test Data**

| <b>RF Power Output</b>                         | 22.913(a) | 500W ERP            | N/A*     |
|------------------------------------------------|-----------|---------------------|----------|
|                                                | 24.232(a) | 100W EIRP           | Complies |
| <b>Occupied Bandwidth (Voice &amp; SAT)</b>    | 2.1049(i) | Mask                | N/A*     |
| <b>Occupies Bandwidth (Wideband Data)</b>      | 2.1049(i) | Mask                | N/A*     |
| <b>Occupied Bandwidth (Digital)</b>            | 2.1049(i) | Mask                | Complies |
| <b>Spurious Emissions at Antenna Terminals</b> | 22.917    | -13 dBm             | N/A*     |
|                                                | 24.238    | -13 dBm             | Complies |
| <b>Field Strength of Spurious Emissions</b>    | 22.917    | -13 dBm             | N/A*     |
|                                                | 24.238    | -13 dBm<br>E.I.R.P. | Complies |
| <b>Frequency Stability</b>                     | 22.355    | 1.5 ppm             | N/A*     |
|                                                | 24.235    | 0.05 ppm            | Complies |

\* These items are NOT applied to the EUT.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

|                                 | Prob. Dist. | Uncertainty(dB)<br>30-1000MHz | Uncertainty(dB)<br>1-6.5GHz | Uncertainty(dB)<br>Conducted |
|---------------------------------|-------------|-------------------------------|-----------------------------|------------------------------|
| Combined Std. Uncertainty $u_c$ | norm.       | $\pm 2.36$                    | $\pm 2.99$                  | $\pm 1.83$                   |



Wei Li  
Lab Manager  
Advanced Compliance Lab

Date: June 16, 2005

**Section 2. General Equipment Specification**

|                              |            |                                                 |                                              |                                                           |
|------------------------------|------------|-------------------------------------------------|----------------------------------------------|-----------------------------------------------------------|
| <b>Supply Voltage</b>        |            | 26VDC                                           |                                              |                                                           |
| <b>Frequency Range</b>       | Cellular   | N/A                                             |                                              |                                                           |
|                              | PCS        | DL/1930-1990MHz                                 |                                              |                                                           |
|                              | Modulation | CDMA2000<br><input checked="" type="checkbox"/> | WCDMA<br><input checked="" type="checkbox"/> | GSM (GXW)<br><input type="checkbox"/>                     |
| <b>Output Impedance</b>      |            | 50ohm                                           |                                              |                                                           |
| <b>Frequency Translation</b> |            | F1-F1<br><input checked="" type="checkbox"/>    | F1-F2<br><input type="checkbox"/>            | N/A<br><input type="checkbox"/>                           |
|                              |            | Software<br><input type="checkbox"/>            | Duplexer Change<br><input type="checkbox"/>  | Full Band Coverage<br><input checked="" type="checkbox"/> |

**DC voltages and DC currents per 2.1033(c)(8)**

The input supply to the transmitter was set at 26 Volts DC. The RF power output was measured with the indicated voltage and current applied into the final RF amplifying device(s).

**1900 MHz Digital Modulation Amplifier**

RF Output, DC Current and RF Input Power are all average values.

Measured Maximum Overdrive RF output: 48.52dBm ( 71.1W)

Measured DC voltage: 27.5V

Measured DC current: 16.4A.

Measured Rated RF output: 47.78dBm ( 60W)

Measured DC voltage: 27.5V

Measured DC current: 15.1A.

Measured Minimum RF output: 20.81dBm (0.12W)

Measured DC voltage: 27.5V

Measured DC current: 5.9A

**Tune-up procedure per 2.1033(c) (9)**

There are no user accessible adjustments or tuning in this amplifier. All necessary adjustments and tuning are performed during manufacture of the product. Any adjustments or tuning after service or repair are done as part of that process as special equipment is required to perform such adjustments.

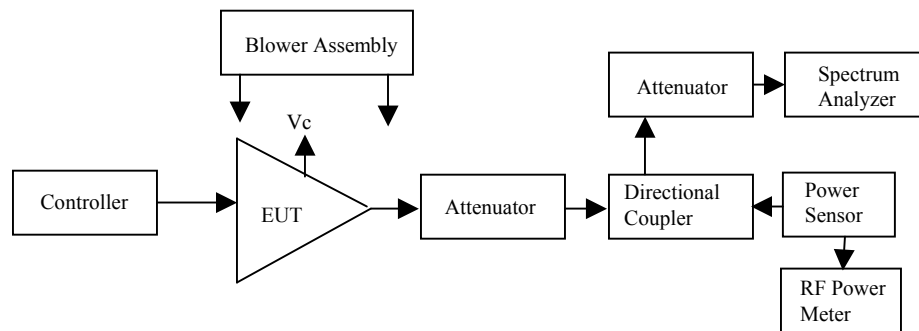
## Description of Operation

This device is a digital multi-carrier amplifier used in BTS in downlink spectrum of 1.9GHz PCS band. All measurements shall be made at room temperature and at nominal DC input voltage.

## System Diagram

See Attachment.

## General EUT Setup



**Section 3. RF Output Power**

|                      |                        |                       |                        |
|----------------------|------------------------|-----------------------|------------------------|
| <b>Name of Test:</b> | <i>RF Output Power</i> | <b>Test Standard:</b> | 22.913(a)<br>24.232(a) |
| <b>Tested By:</b>    | WEI LI                 | <b>Test Date:</b>     | 06/02/2005-06/14/2005  |

**Minimum Standard:** Para. No. 22.913(a). The maximum effective radiated power (ERP) of base station transmitters and cellular repeaters must not exceed 500 Watts (57dBm).

Para. No. 24.232(a). The maximum peak output power of base transmitters should not exceed 100 Watts EIRP (50dBm).

**Method of Measurement:** Per 2.1046: The RF Power Output shall be measured at the output connector of the DMAU. The output level shall be +47.78 dBm (60 watts) +2 dB, -4 dB over the PCS frequency band: 1930 to 1990 MHz. The tolerance range is per TIA/EIA-97-D, Section 4.3.1.3.

Using power meter, power measurements shall be taken at the low band edge, mid, and high band edge frequencies for CDMA2000 and WCDMA modulations.

**Test Result:**

**Complies**

**Test Data:**

## Rated Output Power – Normal Condition

| PCS Band                          | Channel                                                 | Modulation | Power Output (dBm) | Rated Power (dBm) | Tolerance |
|-----------------------------------|---------------------------------------------------------|------------|--------------------|-------------------|-----------|
| Downlink                          | Low                                                     | CDMA2000   | 48.09              | 47.78             | 0.31      |
|                                   | Mid                                                     | CDMA2000   | 48.05              | 47.78             | 0.27      |
|                                   | High                                                    | CDMA2000   | 47.98              | 47.78             | 0.20      |
|                                   | Low                                                     | WCDMA      | 48.11              | 47.78             | 0.33      |
|                                   | Mid                                                     | WCDMA      | 48.04              | 47.78             | 0.26      |
|                                   | High                                                    | WCDMA      | 48.00              | 47.78             | 0.22      |
| Power at Amplifier RF Input (dBm) | -15 (Maximum gain)                                      |            |                    |                   |           |
| Ref Offset                        | Ref offset=Cable&Attenuator&Coupler Attenuation=50.05dB |            |                    |                   |           |

## Maximum Output Power – Overdrive Condition

The input is set to a level that generates maximum limited output power without causing shutdown of the amplifier output. The output level shall be recorded.

| PCS Band                          | Channel                                                 | Modulation | Power Output (dBm) | Rated Power (dBm) | Tolerance |
|-----------------------------------|---------------------------------------------------------|------------|--------------------|-------------------|-----------|
| Downlink                          | Low                                                     | CDMA2000   | 48.43              | 47.78             | 0.65      |
|                                   | Mid                                                     | CDMA2000   | 48.39              | 47.78             | 0.61      |
|                                   | High                                                    | CDMA2000   | 48.32              | 47.78             | 0.54      |
|                                   | Low                                                     | WCDMA      | 48.52              | 47.78             | 0.74      |
|                                   | Mid                                                     | WCDMA      | 48.48              | 47.78             | 0.70      |
|                                   | High                                                    | WCDMA      | 48.43              | 47.78             | 0.65      |
| Power at Amplifier RF Input (dBm) | -15+5.9=-9.1                                            |            |                    |                   |           |
| Ref Offset                        | Ref offset=Cable&Attenuator&Coupler Attenuation=50.05dB |            |                    |                   |           |

**Section 4. Occupied Bandwidth**

|                      |                           |                       |                       |
|----------------------|---------------------------|-----------------------|-----------------------|
| <b>Name of Test:</b> | <i>Occupied Bandwidth</i> | <b>Test Standard:</b> | <i>2.1049(i)</i>      |
| <b>Tested By:</b>    | WEI LI                    | <b>Test Date:</b>     | 06/02/2005-06/14/2005 |

**Minimum Standard:** Not defined by FCC. Input vs. Output.

**Method of Measurement:** Spectrum Analyzer Settings:  
RBW: CDMA2000 (30 kHz), WCDMA (100KHz), CDMA(30KHz),  
GSM (30 kHz), NADC (1 kHz) and CDPD (1 kHz)  
VBW:  $\geq$ RBW  
Span: As required  
Sweep: Auto  
Input Signal Characteristics: Generated Waveform by Digital Inputs  
RF level: Rated, recommended by manufacturer

**Test Result:**

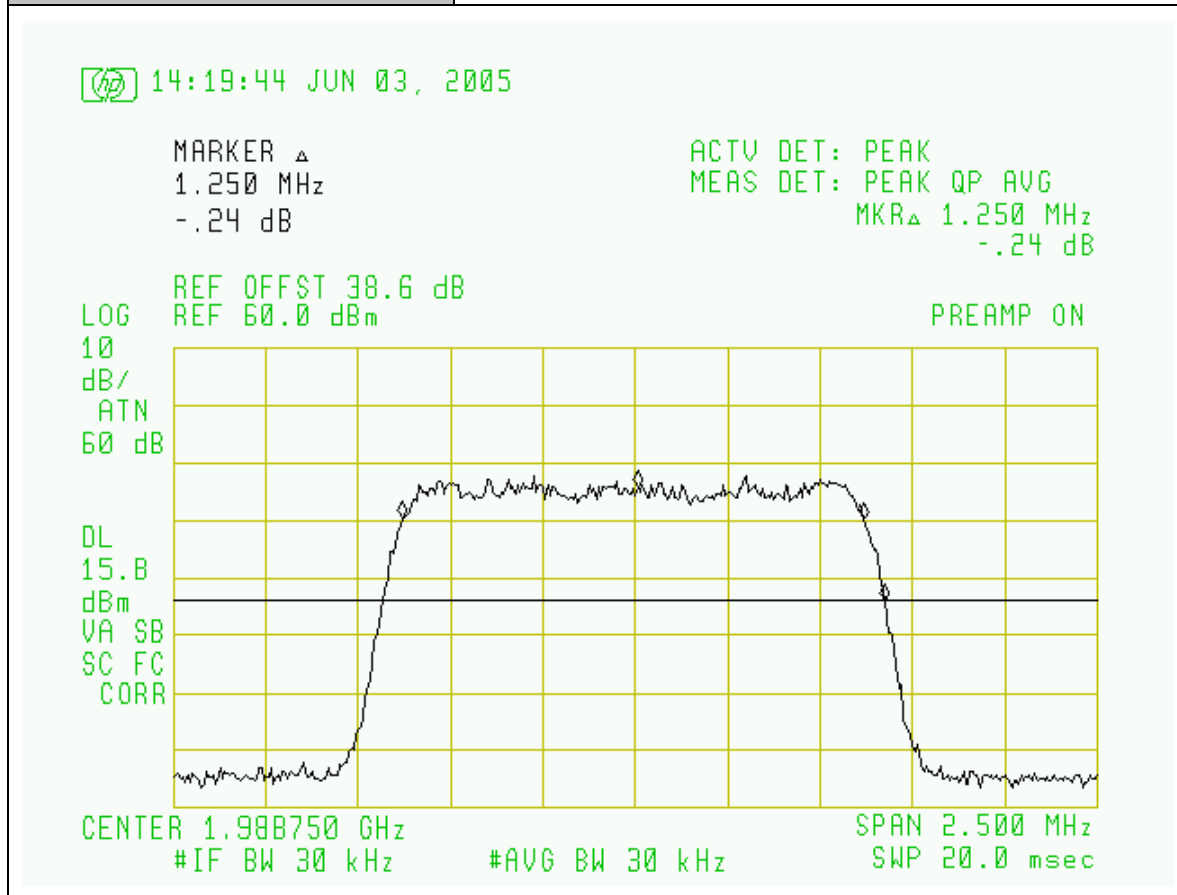
**Complies**

**Test Data:**

Attached Plots

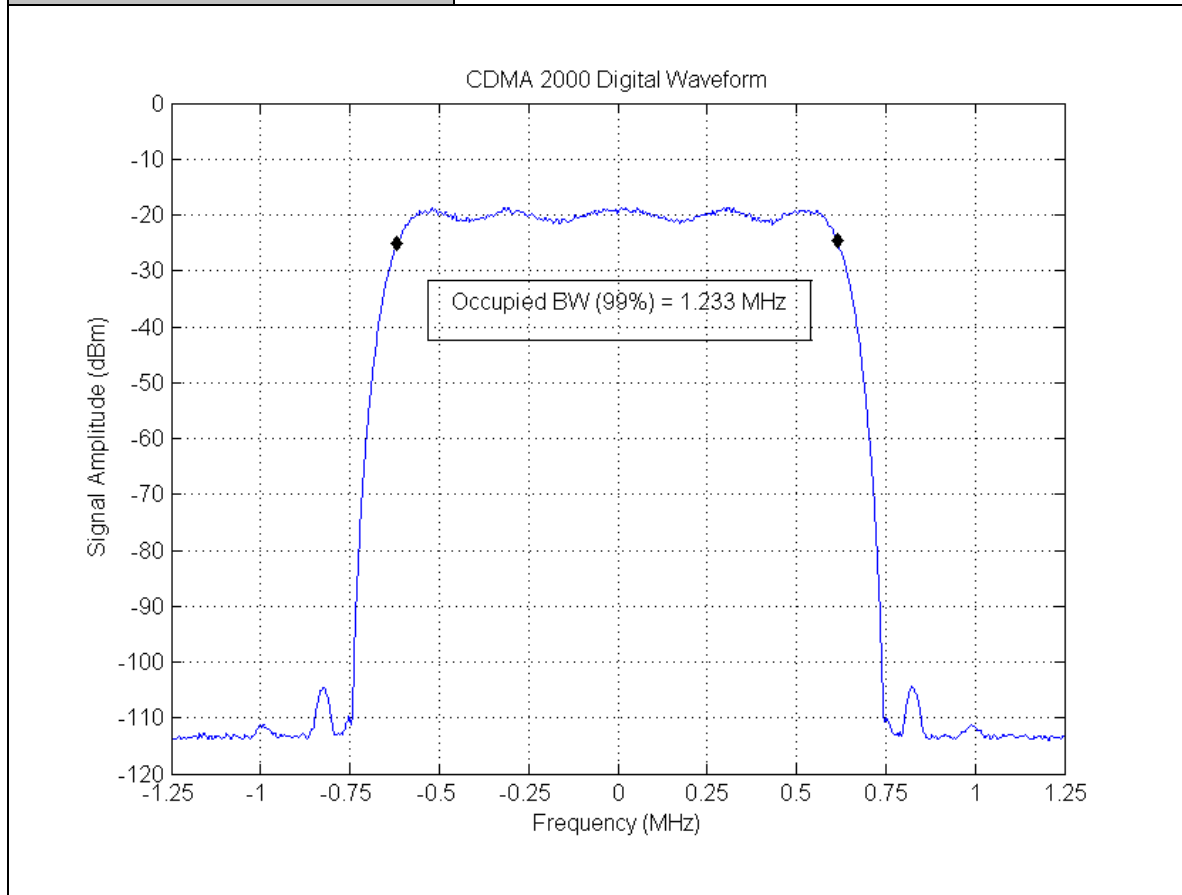
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                   |
|-----------------------|---------------------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands                     |
| <b>Plot Name:</b>     | Downlink, Hi-Channel, CDMA2000 Modulation         |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT |



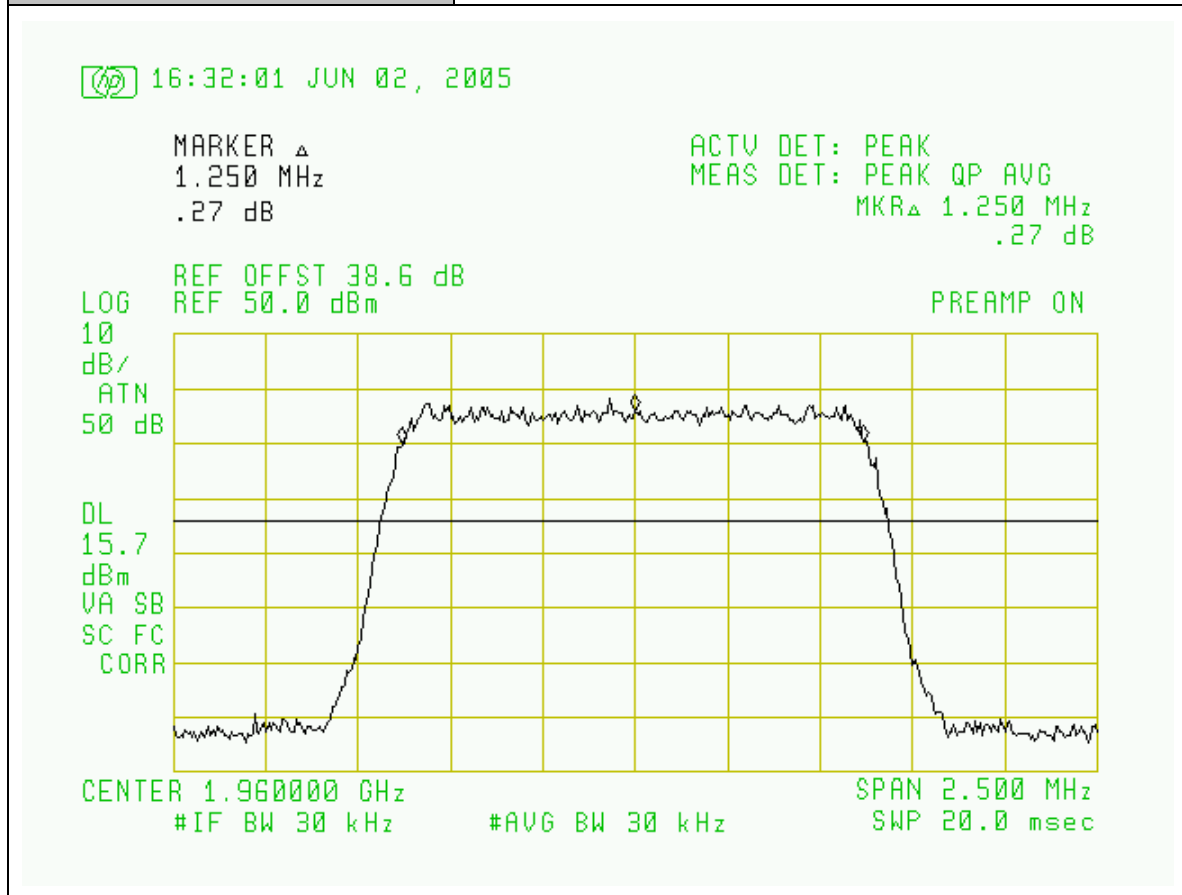
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|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                           |
|-----------------------|-------------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands             |
| <b>Plot Name:</b>     | Downlink, Hi-Channel, CDMA2000 Modulation |
| <b>Configuration:</b> | Digital Input: -15dBm                     |



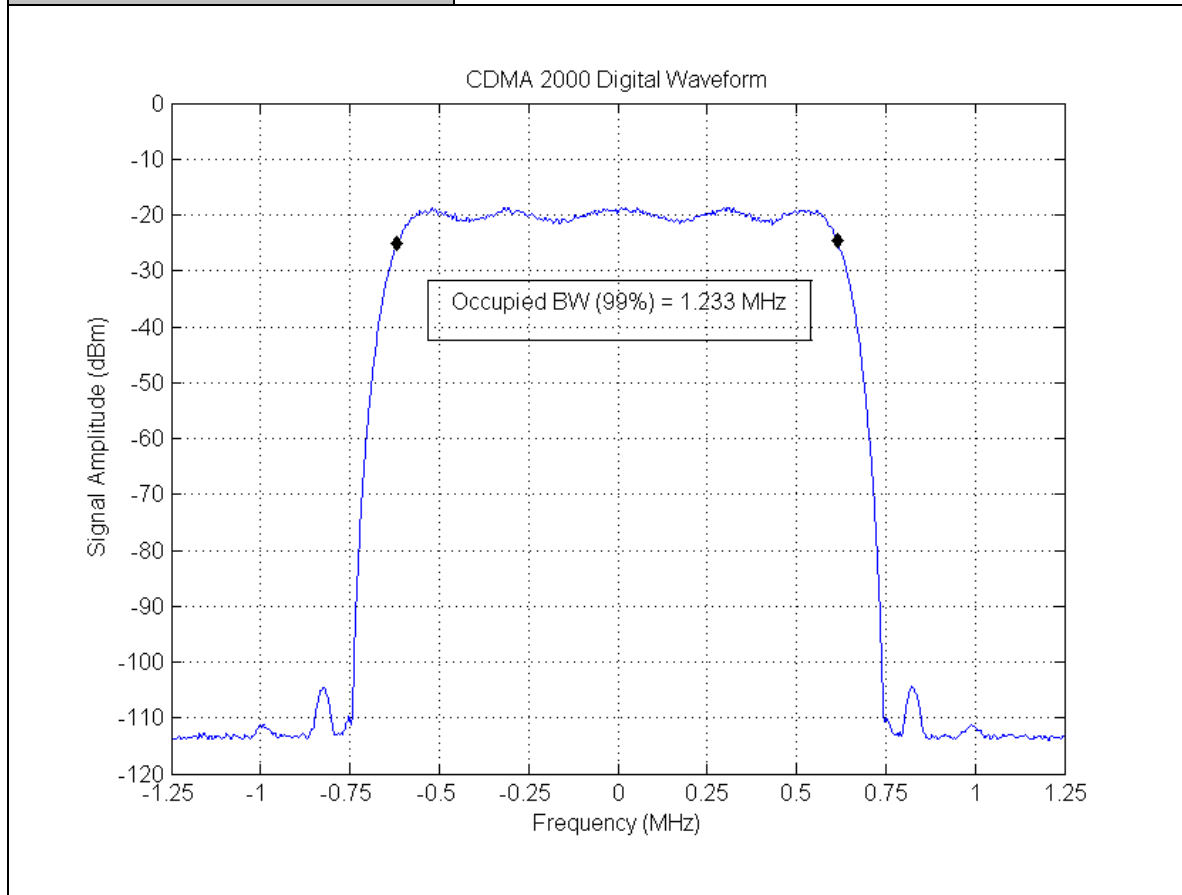
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| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                   |
|-----------------------|---------------------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands                     |
| <b>Plot Name:</b>     | Downlink, Mid-Channel, CDMA2000 Modulation        |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT |



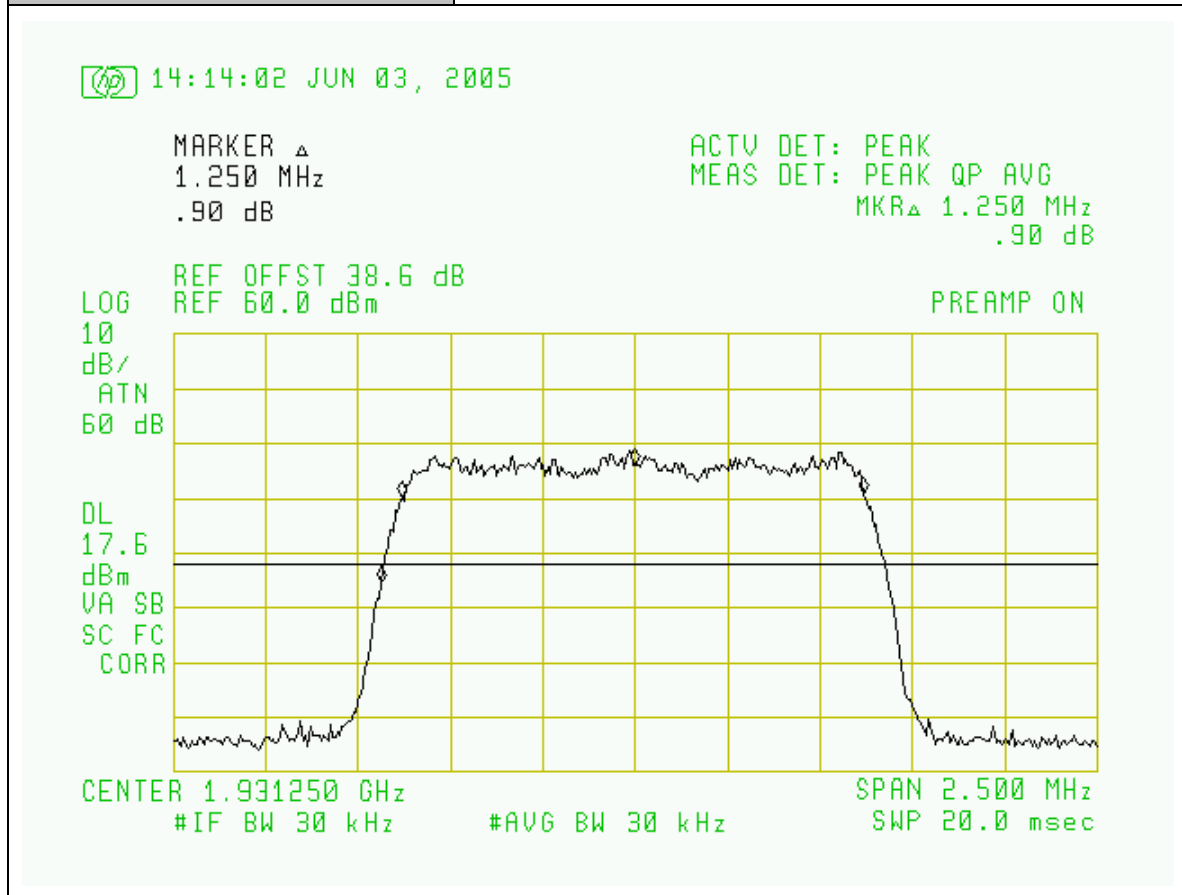
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| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                            |
|-----------------------|--------------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands              |
| <b>Plot Name:</b>     | Downlink, Mid-Channel, CDMA2000 Modulation |
| <b>Configuration:</b> | Digital Input: -15dBm                      |



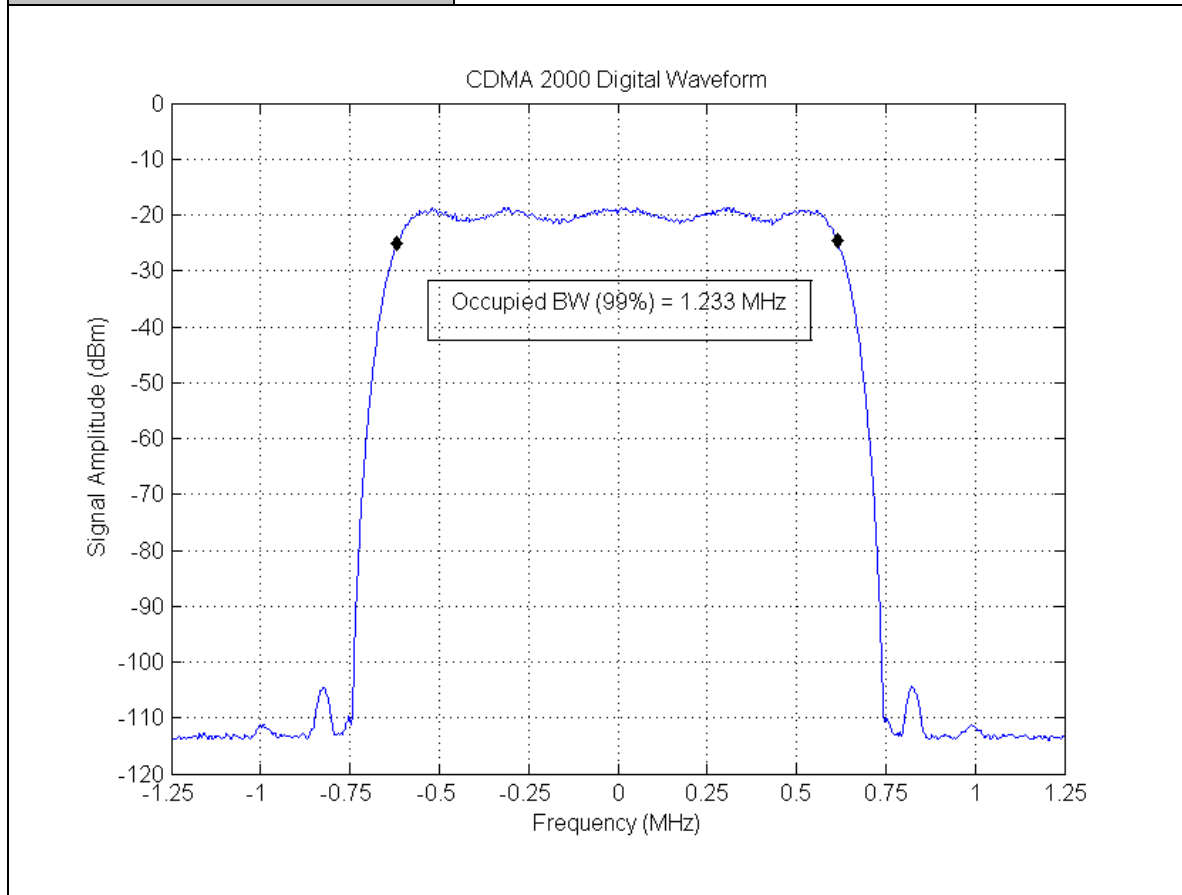
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| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                   |
|-----------------------|---------------------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands                     |
| <b>Plot Name:</b>     | Downlink, Low-Channel, CDMA2000 Modulation        |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT |



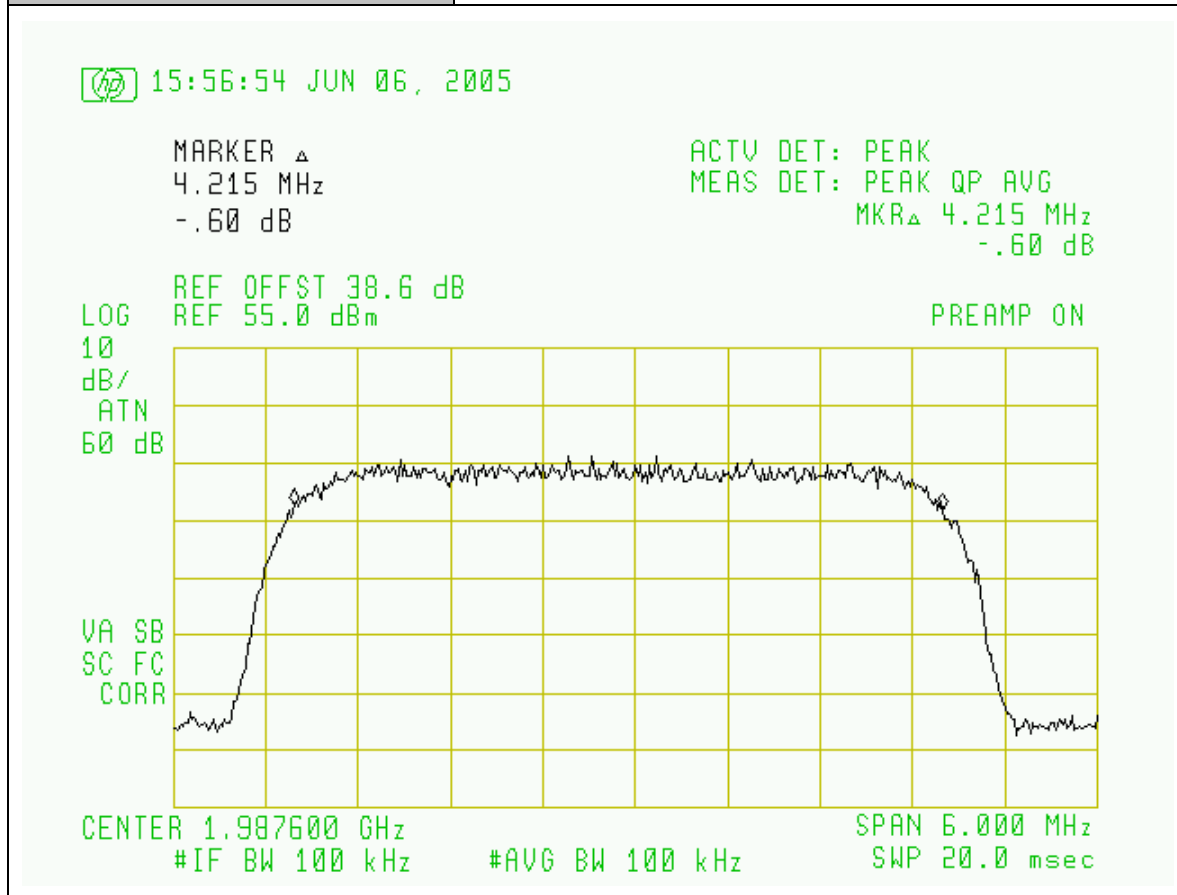
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| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                        |
|-----------------------|----------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands          |
| <b>Plot Name:</b>     | Downlink, Low-Channel, CDMA Modulation |
| <b>Configuration:</b> | Digital Input: -15dBm                  |



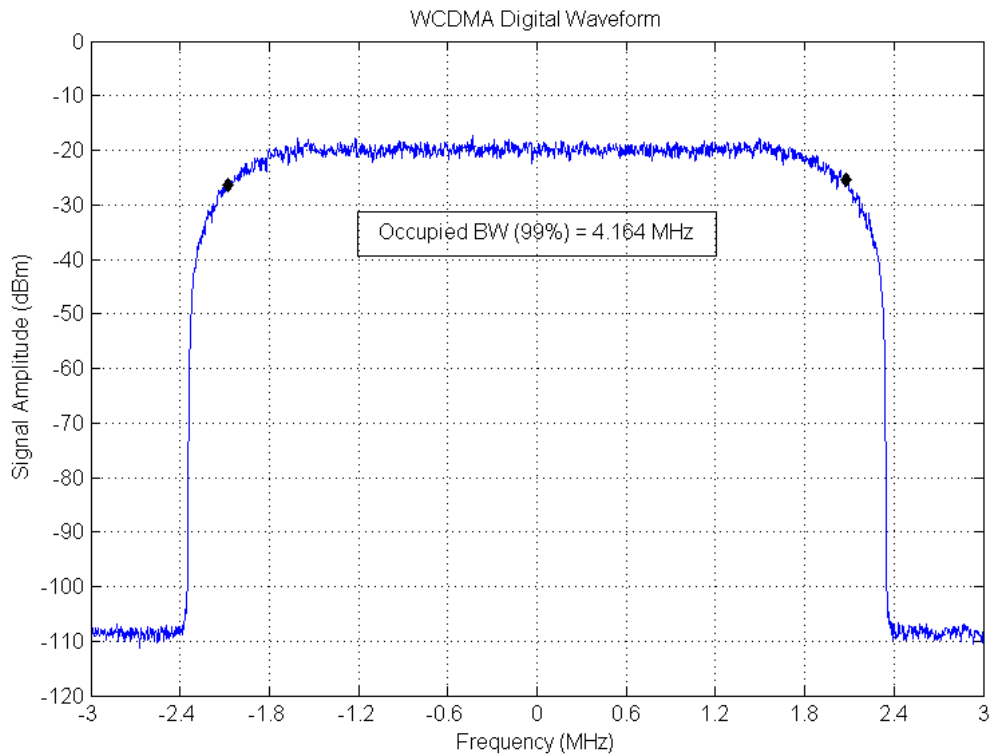
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| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                   |
|-----------------------|---------------------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands                     |
| <b>Plot Name:</b>     | Downlink, Hi-Channel, WCDMA Modulation            |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT |



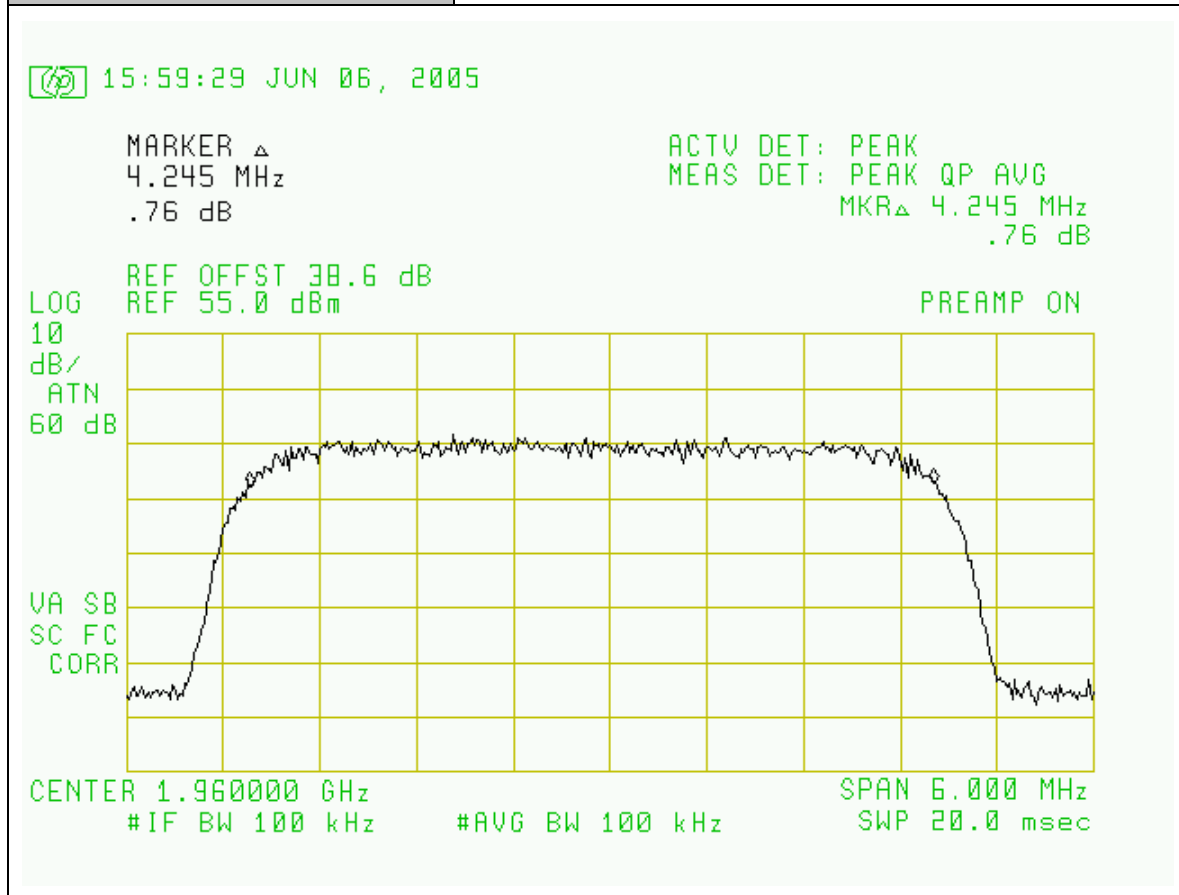
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| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                        |
|-----------------------|----------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands          |
| <b>Plot Name:</b>     | Downlink, Hi-Channel, WCDMA Modulation |
| <b>Configuration:</b> | Digital Input: -15dBm                  |



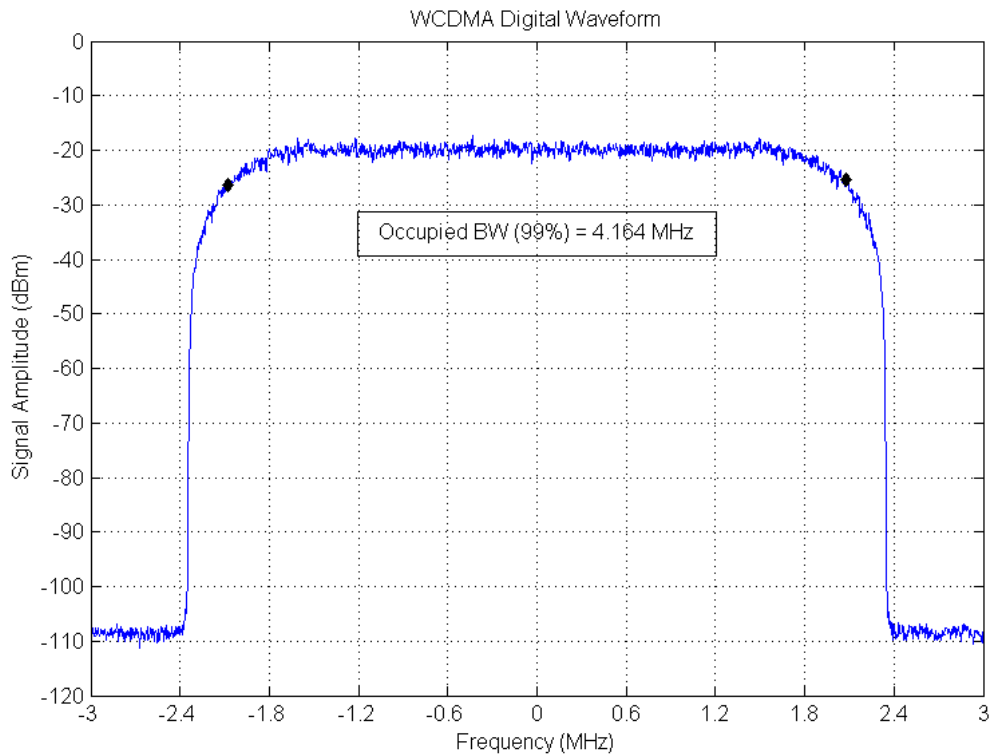
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| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                   |
|-----------------------|---------------------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands                     |
| <b>Plot Name:</b>     | Downlink, Mid-Channel, WCDMA Modulation           |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT |



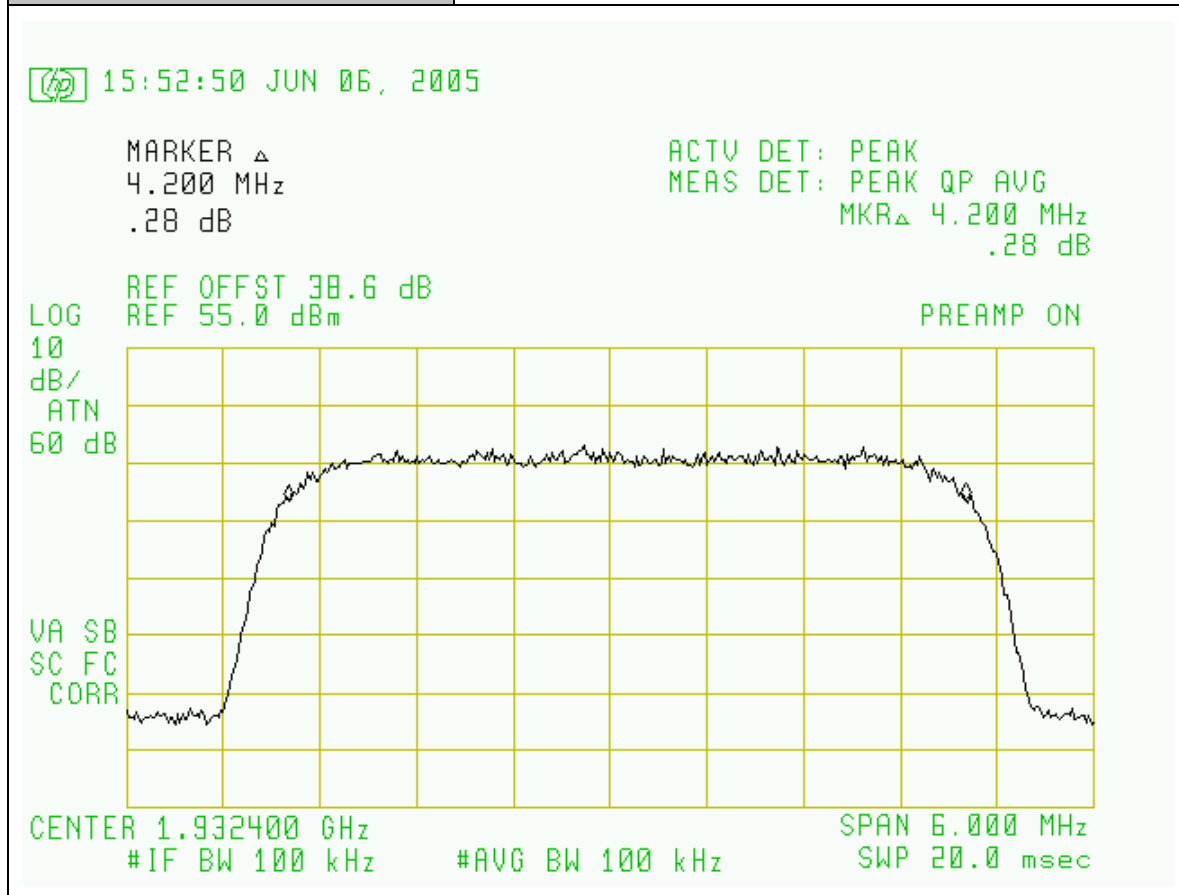
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| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                         |
|-----------------------|-----------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands           |
| <b>Plot Name:</b>     | Downlink, Mid-Channel, WCDMA Modulation |
| <b>Configuration:</b> | Digital Input: -15dBm                   |



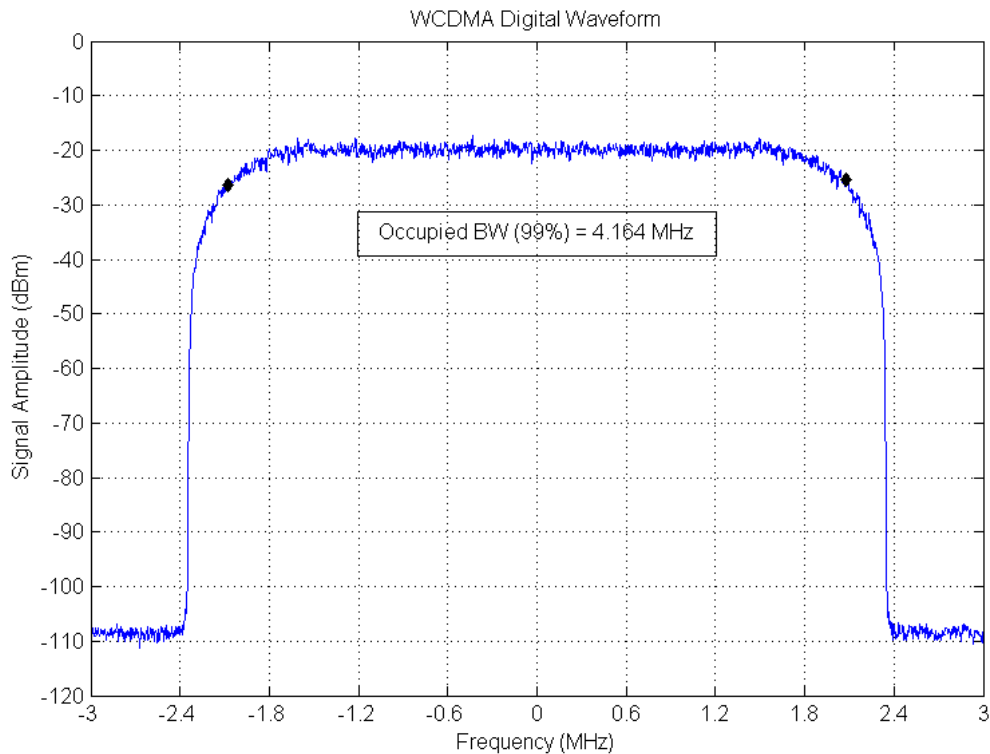
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| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                   |
|-----------------------|---------------------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands                     |
| <b>Plot Name:</b>     | Downlink, Low-Channel, WCDMA Modulation           |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT |



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                         |
|-----------------------|-----------------------------------------|
| <b>Section:</b>       | Occupied Bandwidth: PCS Bands           |
| <b>Plot Name:</b>     | Downlink, Low-Channel, WCDMA Modulation |
| <b>Configuration:</b> | Digital Input: -15dBm                   |



**Section 5. Spurious Emissions at Antenna Terminals**

|                      |                                                |                       |                       |
|----------------------|------------------------------------------------|-----------------------|-----------------------|
| <b>Name of Test:</b> | <i>Spurious Emissions at Antenna Terminals</i> | <b>Test Standard:</b> | 22.917<br>24.238(a)   |
| <b>Tested By:</b>    | WEI LI<br>EDWARD LEE                           | <b>Test Date:</b>     | 06/02/2005-06/14/2005 |

**Minimum Standard:** Para. No. 22.917(e). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least  $43 + 10 \log P$ . This is equivalent to -13 dBm absolute power.

Para. No. 24.238(a). The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a licensee's frequency block (-13dBm).

**Method of Measurement:** Spectrum Analyzer Settings:  
 RBW: 100 kHz. As required for digital modulations.  
 RBW: 1MHz. When frequency is located above 1GHz.  
 VBW:  $\geq$ RBW  
 Start Frequency: 9KHz or Lowest Clock Frequency  
 Stop Frequency: 10 GHz (Cellular), 20GHz (PCS)  
 Sweep: Auto  
 Using in-band filter if needed.  
 For Inter-modulation measurement: Two RF signals set as inputs. The frequencies of both RF signals shall be within the repeater's operating band. The level of both RF input signals shall be increased, until the maximum rated output power per channel, as declared by the manufacturer, is reached.  
 Frequencies:  $f_1 = F_{(\text{Low CH/Mid CH/High CH})}$ ,  $f_2 = f_1 \pm \Delta$  (Spacing)  
 Each RF Input Level: about -3dB comparing to the max. input level of single RF Input test

**Test Result:**

**Complies**

**Test Data:**

Attached Plots

|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port:<br>PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Chn, Inter-modulation                                       |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF<br>OUTPUT                     |

16:37:28 JUN 07, 2005

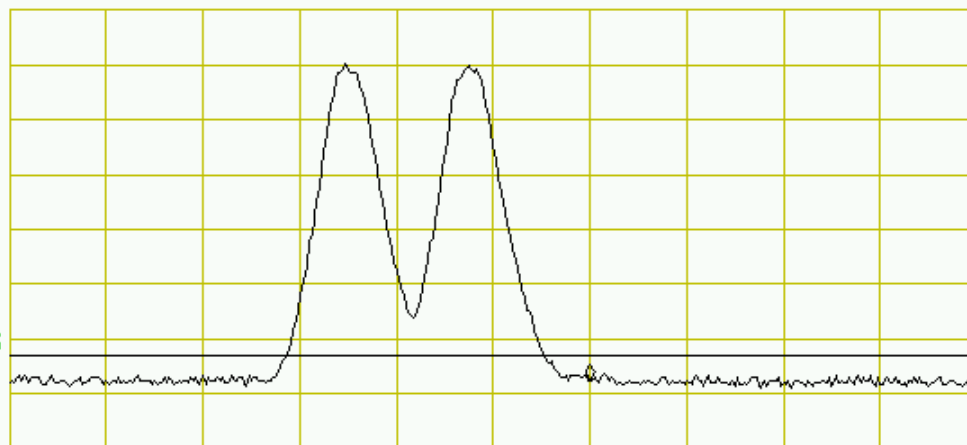
DISPLAY LINE  
-13.0 dBm

ACTV DET: SMPL  
MEAS DET: PEAK QP AVG  
MKR 1.99500 GHz  
-17.53 dBm

REF OFFST 42.5 dB  
REF 50.0 dBm

PREAMP ON

LOG  
10  
dB/  
ATN  
50 dB  
AVG  
50  
DL  
-13.0  
dBm  
WA SB  
SC FC  
CORR



CENTER 1.99000 GHz

#IF BW 1.0 MHz

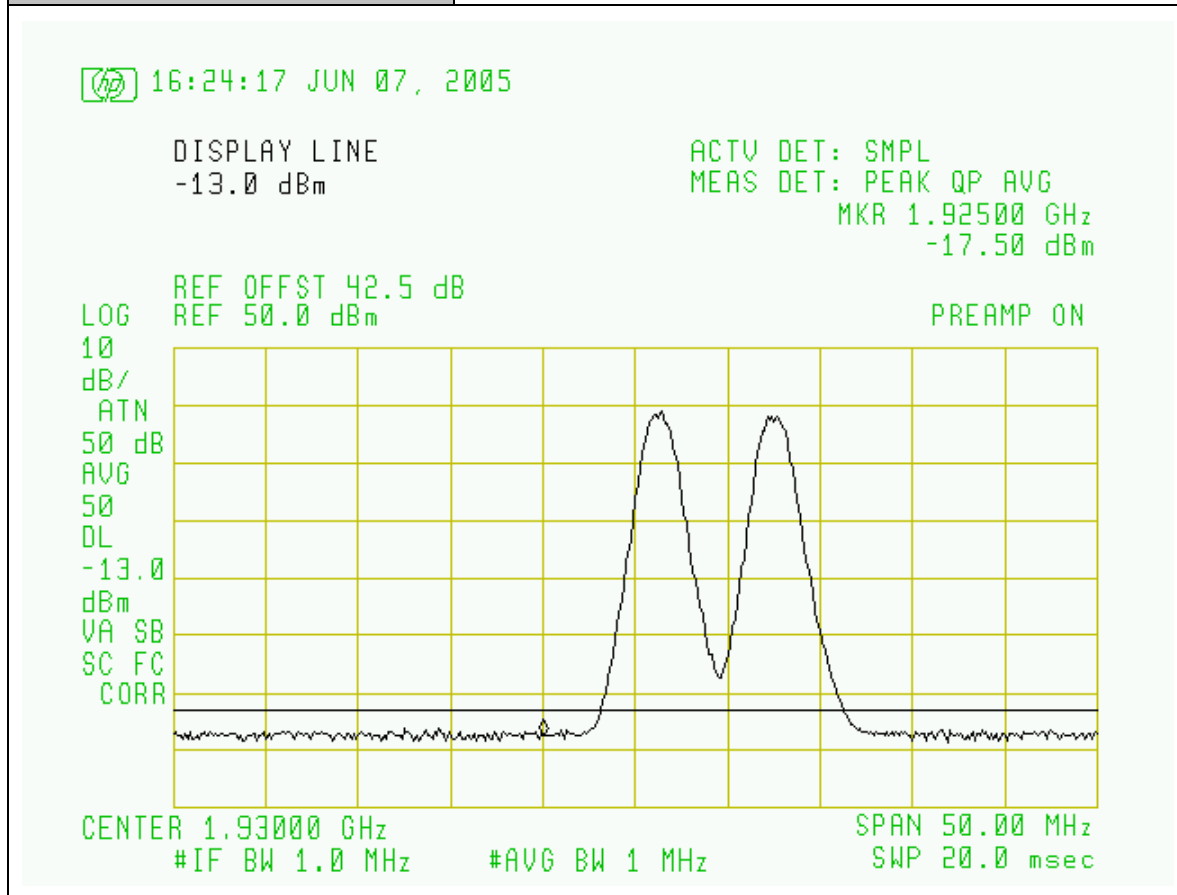
#AVG BW 1 MHz

SPAN 50.00 MHz

SWP 20.0 msec

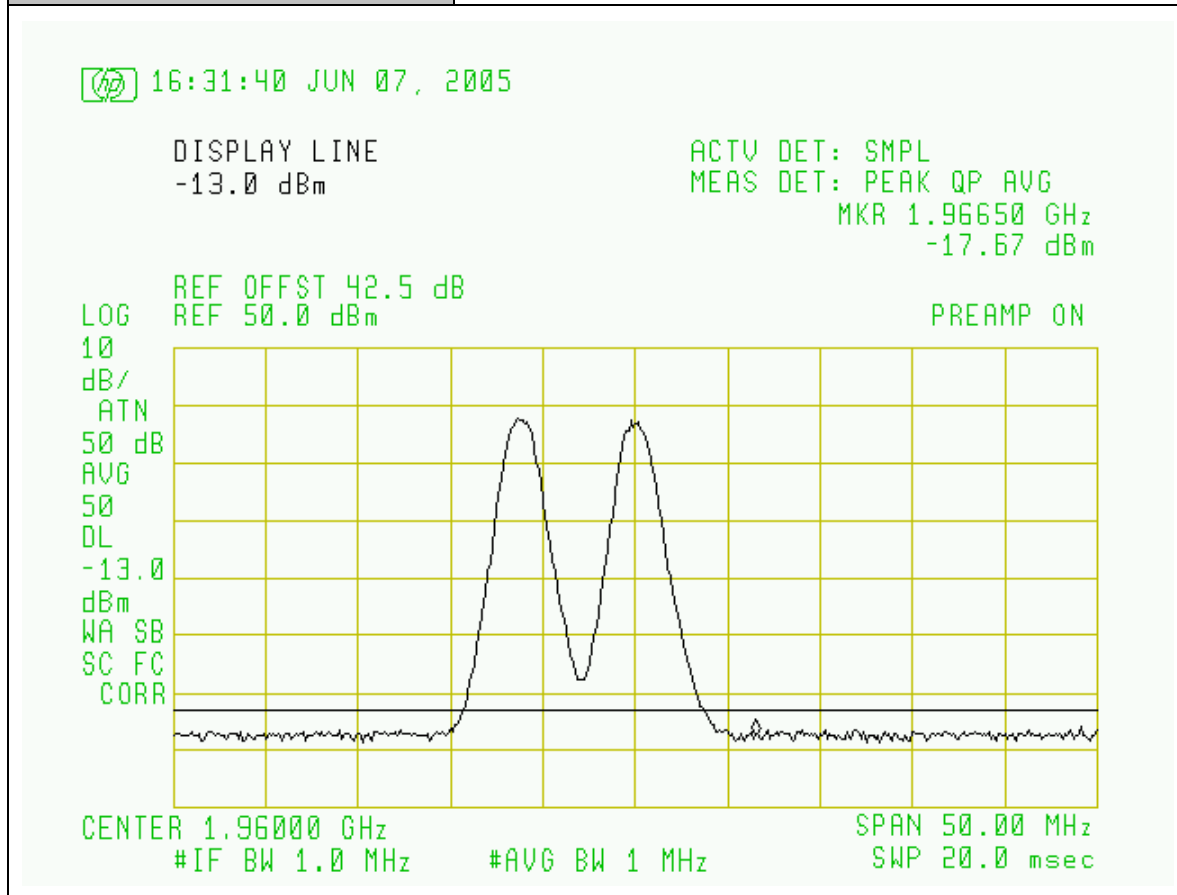
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port:<br>PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Chn, Inter-modulation                                      |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF<br>OUTPUT                     |



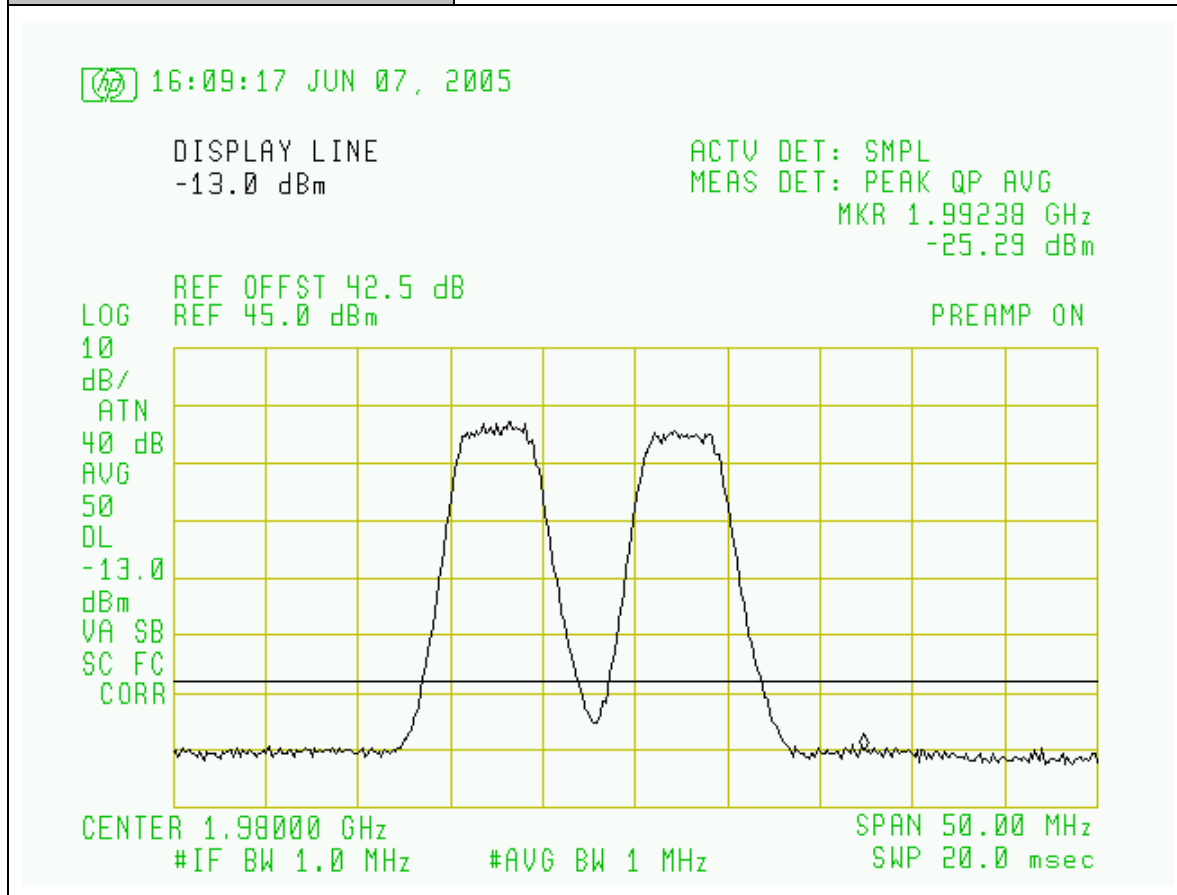
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port:<br>PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Chn, Inter-modulation                                      |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF<br>OUTPUT                     |



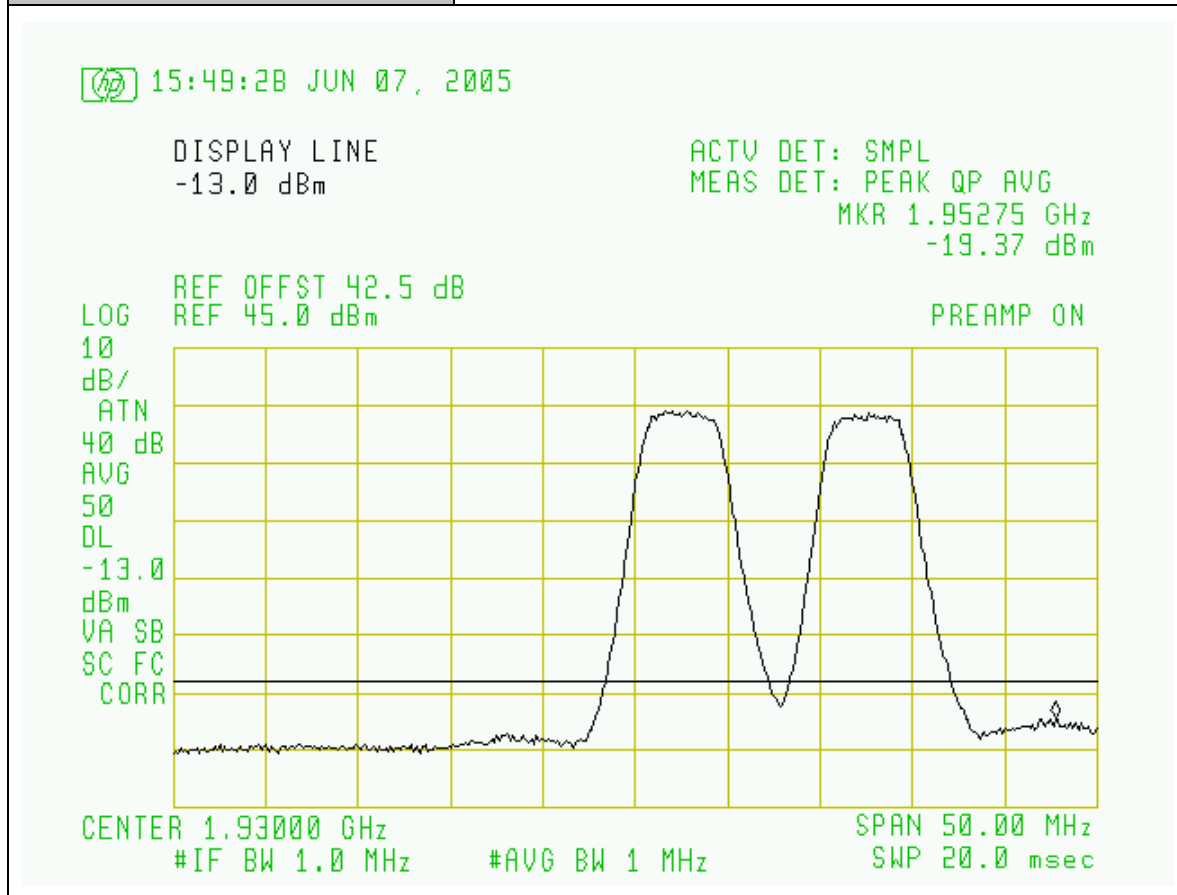
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port:<br>PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Chn, Inter-modulation                                    |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF<br>OUTPUT                  |



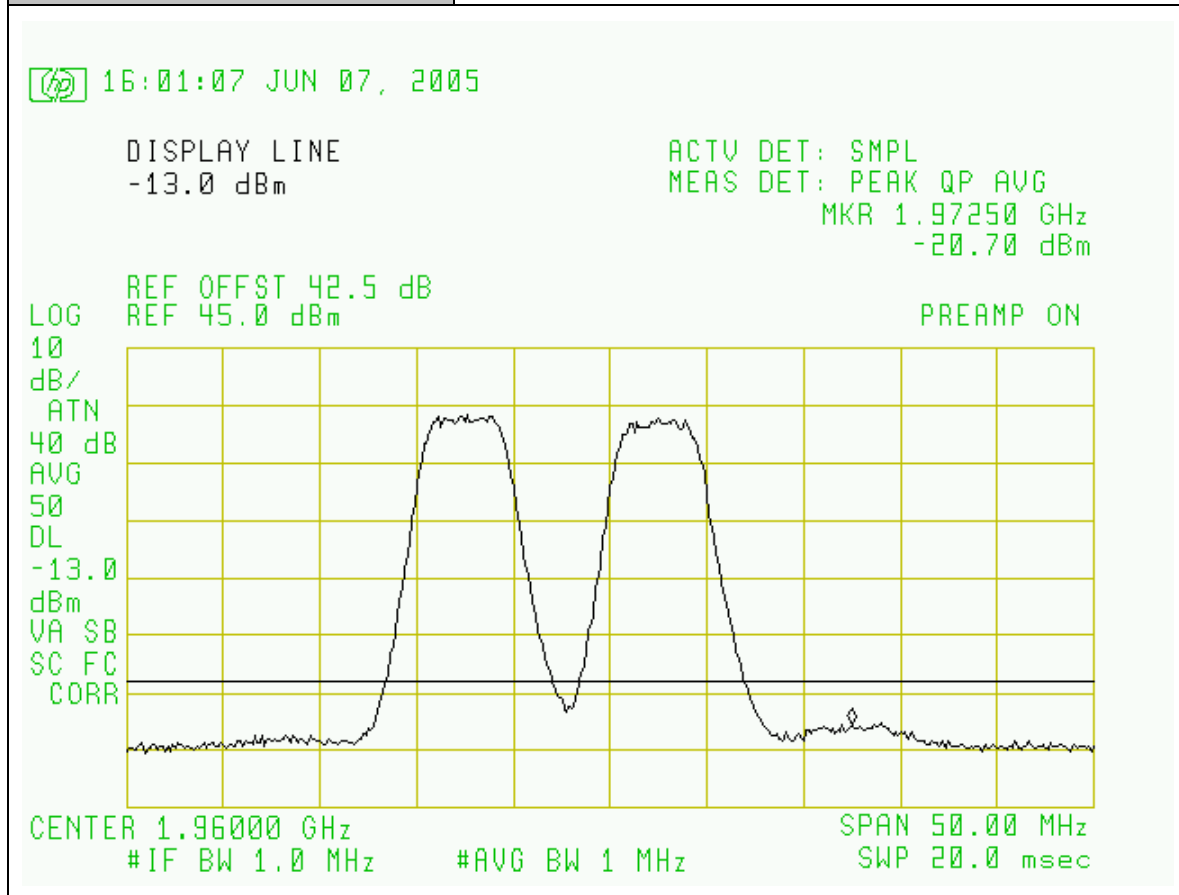
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port:<br>PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Chn, Inter-modulation                                   |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF<br>OUTPUT                  |



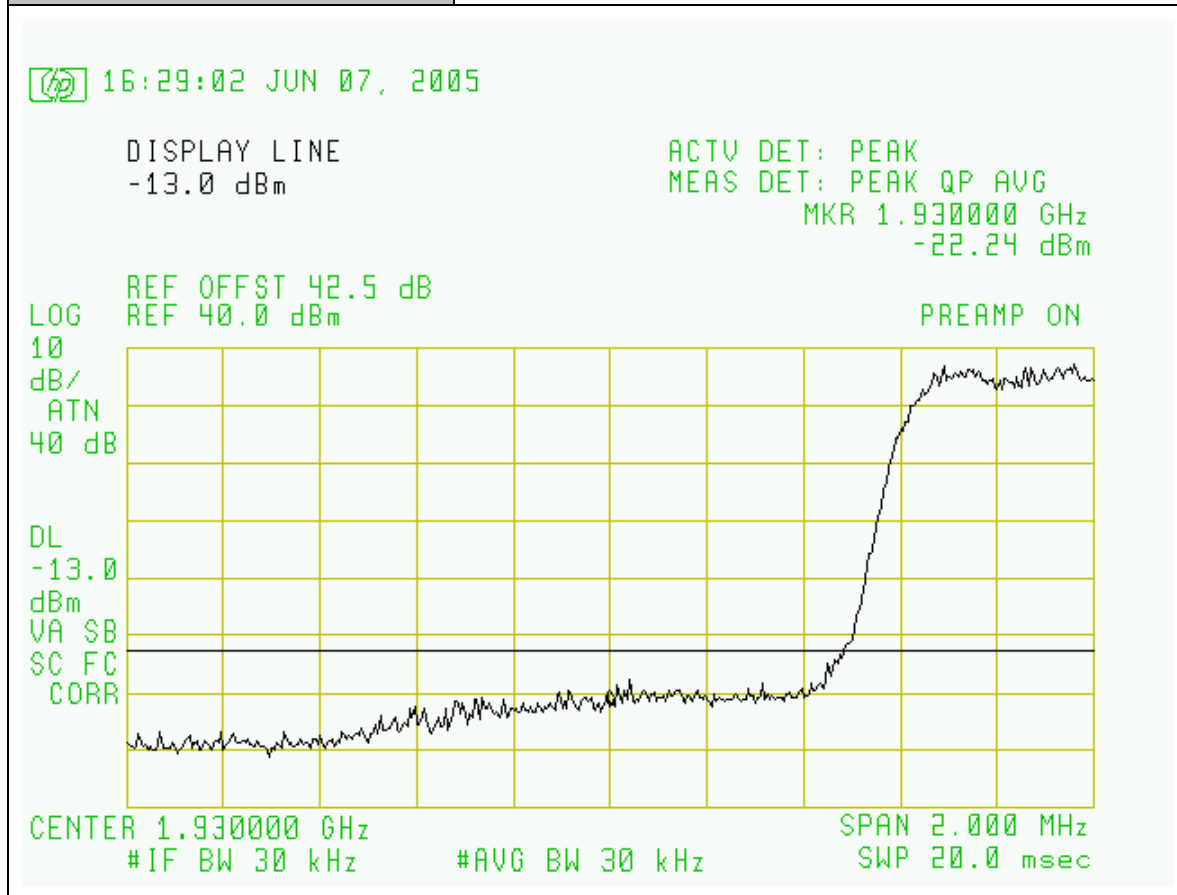
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port:<br>PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Chn, Inter-modulation                                   |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF<br>OUTPUT                  |



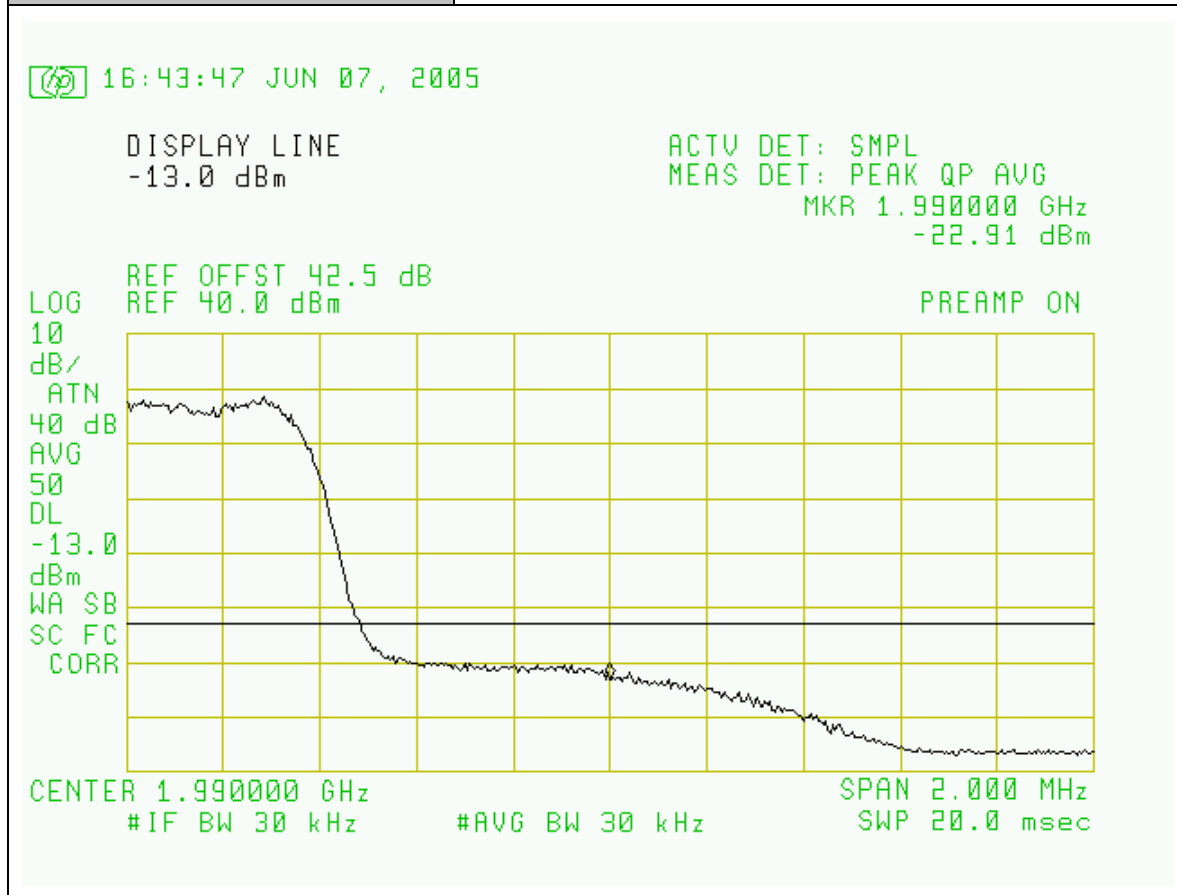
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port:<br>PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Chn, Lower Bandedge                                        |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF<br>OUTPUT                     |



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port:<br>PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Chn, Upper Bandedge                                         |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF<br>OUTPUT                     |



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port:<br>PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Chn, Lower Bandedge                                     |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF<br>OUTPUT                  |

15:53:01 JUN 07, 2005

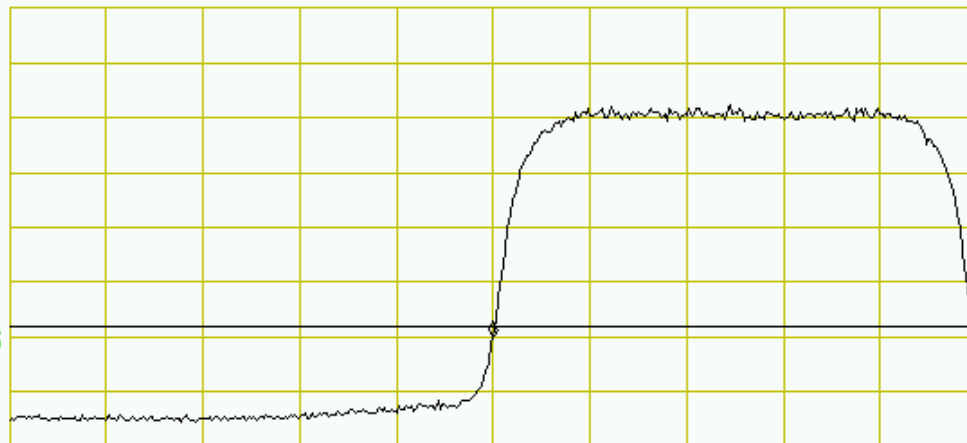
MARKER  
1.93000 GHz  
-15.43 dBm

ACTV DET: SMPL  
MEAS DET: PEAK QP AVG  
MKR 1.93000 GHz  
-15.43 dBm

REF OFFST 42.5 dB  
REF 45.0 dBm

PREAMP ON

LOG  
10  
dB/  
ATN  
40 dB  
AVG  
50  
DL  
-13.0  
dBm  
VA SB  
SC FC  
CORR



CENTER 1.93000 GHz

#IF BW 100 kHz

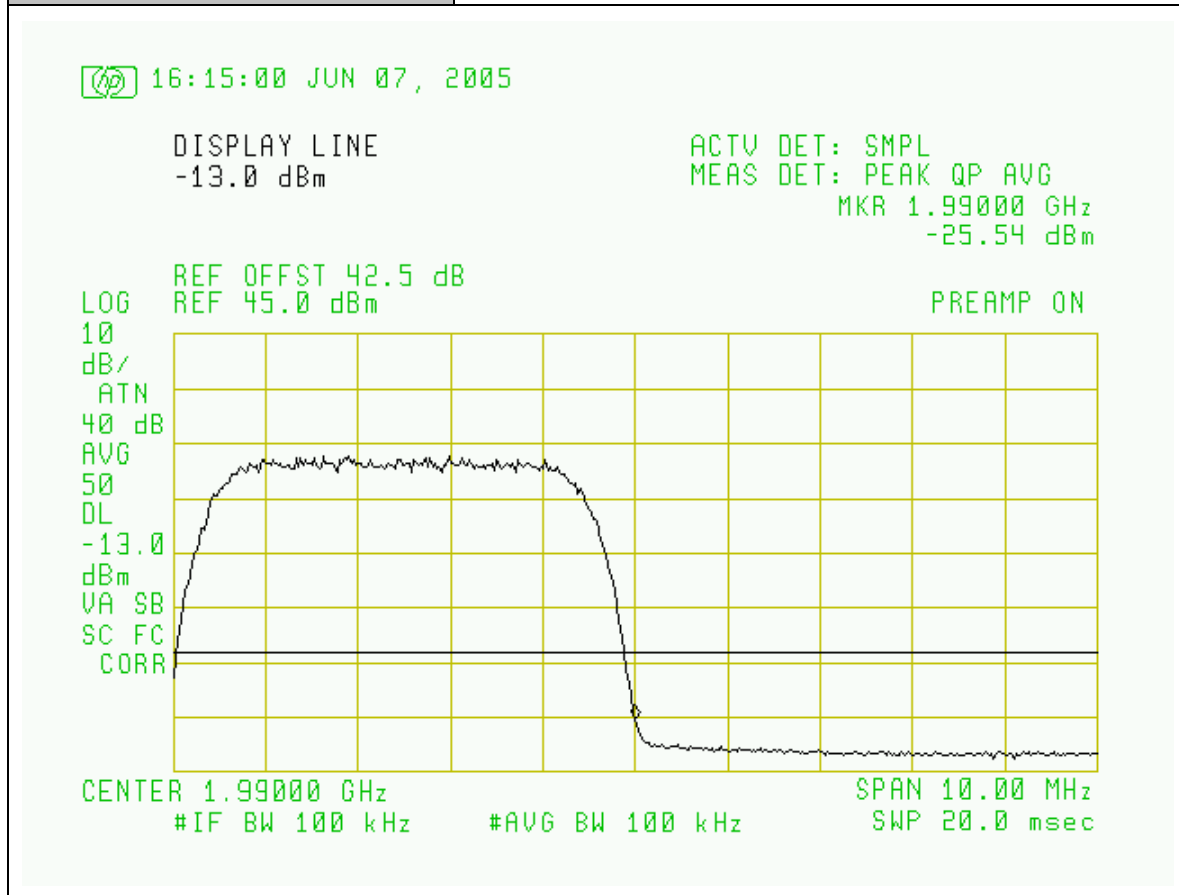
#AVG BW 100 kHz

SPAN 10.00 MHz

SWP 20.0 msec

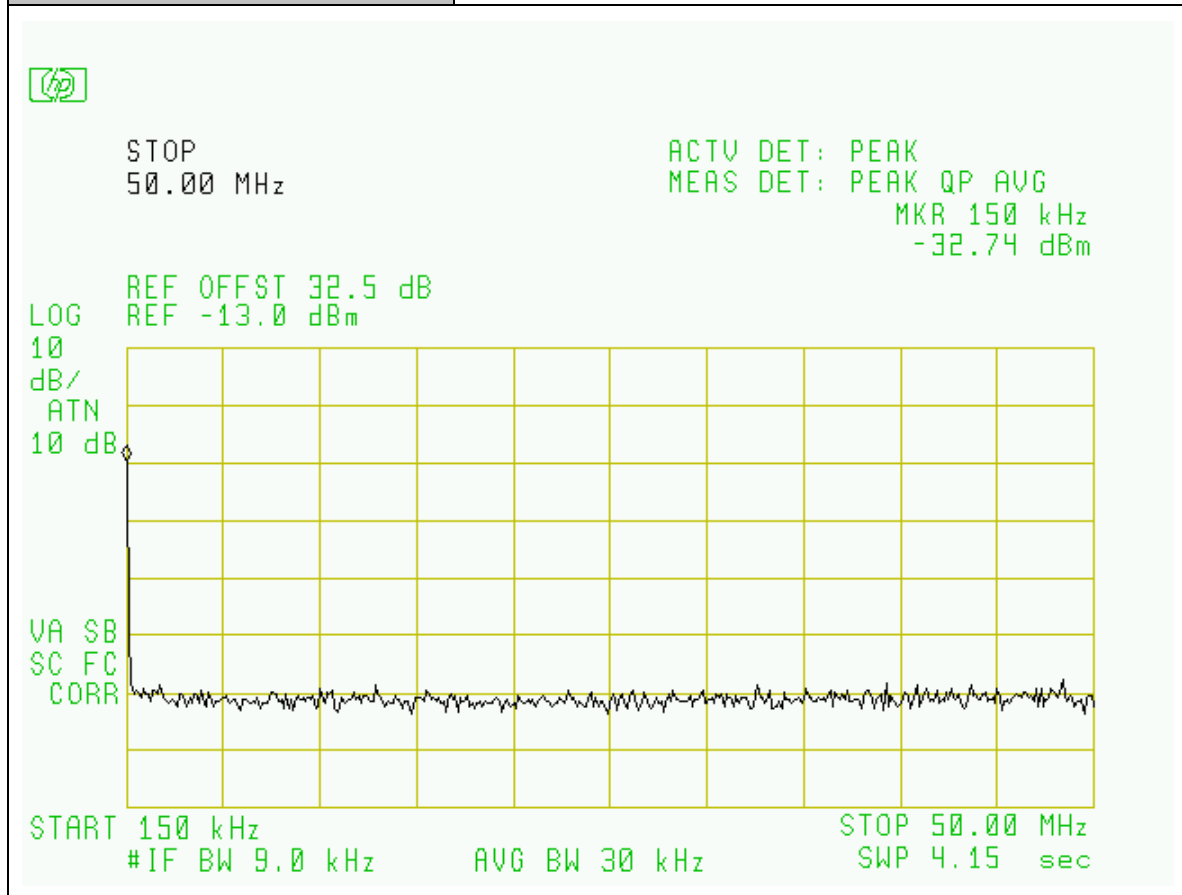
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port:<br>PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Chn, Upper Bandedge                                      |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF<br>OUTPUT                  |



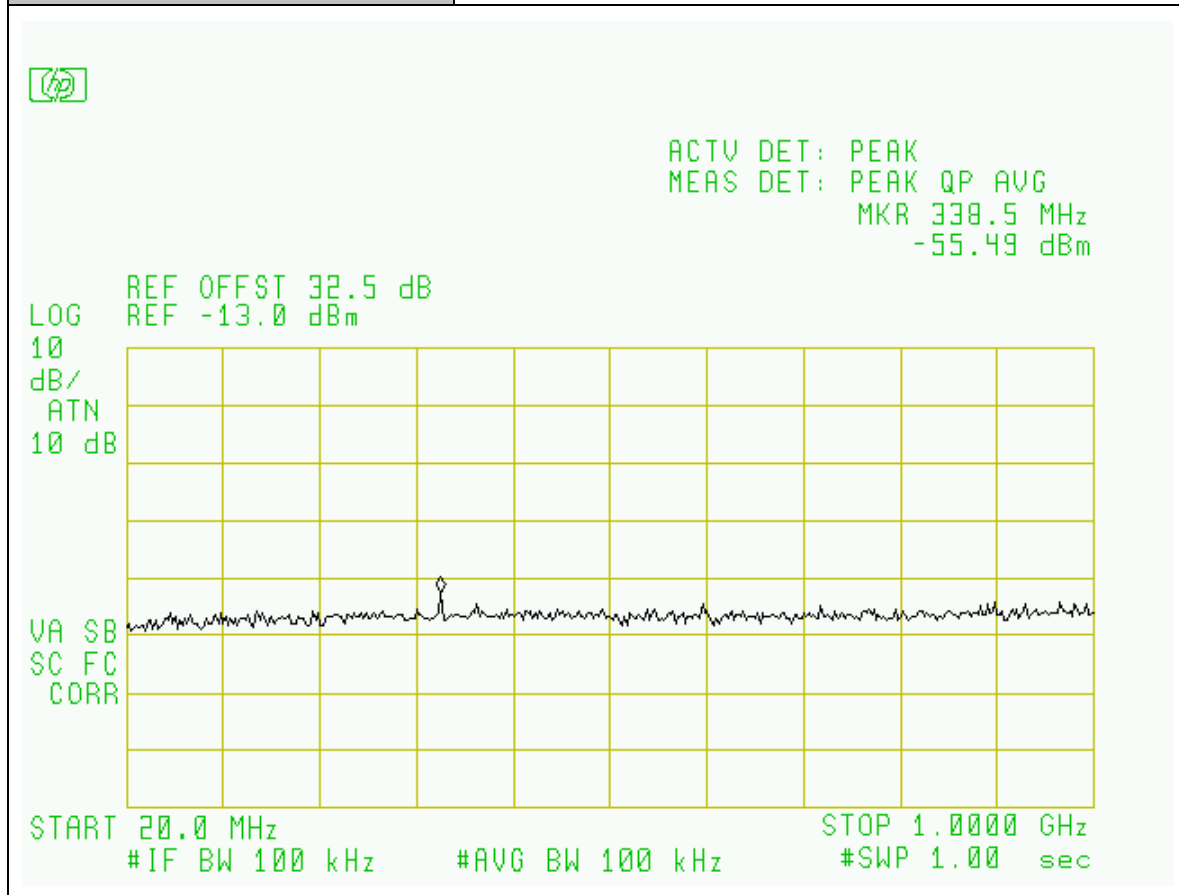
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Channel                                                  |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



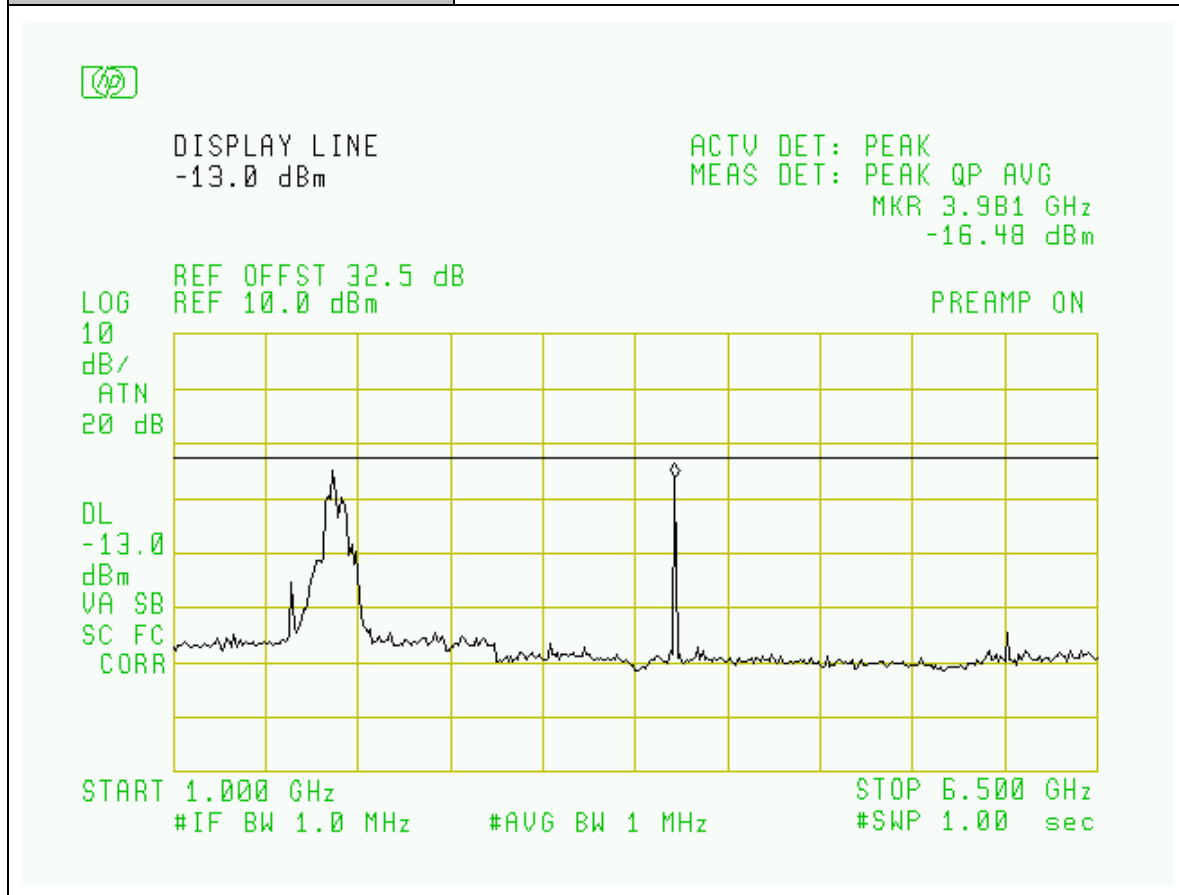
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Channel                                                  |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



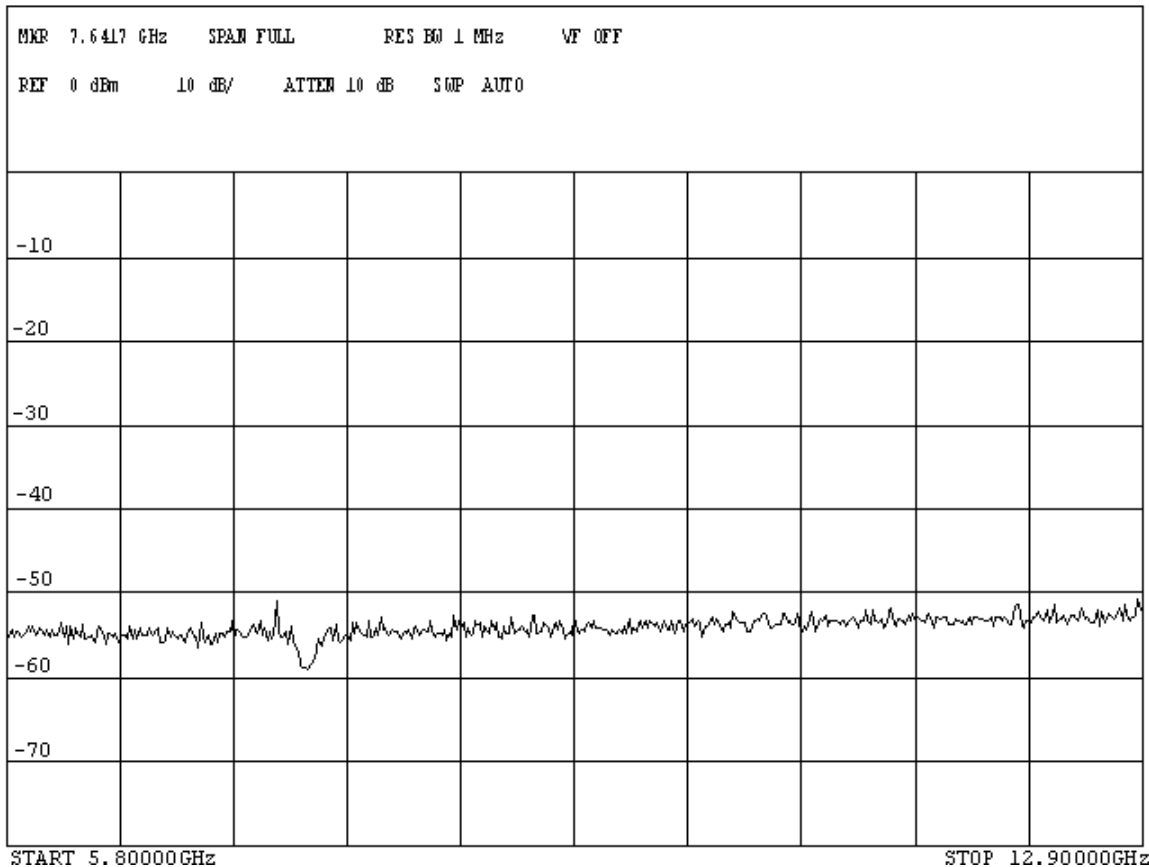
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Channel                                                  |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



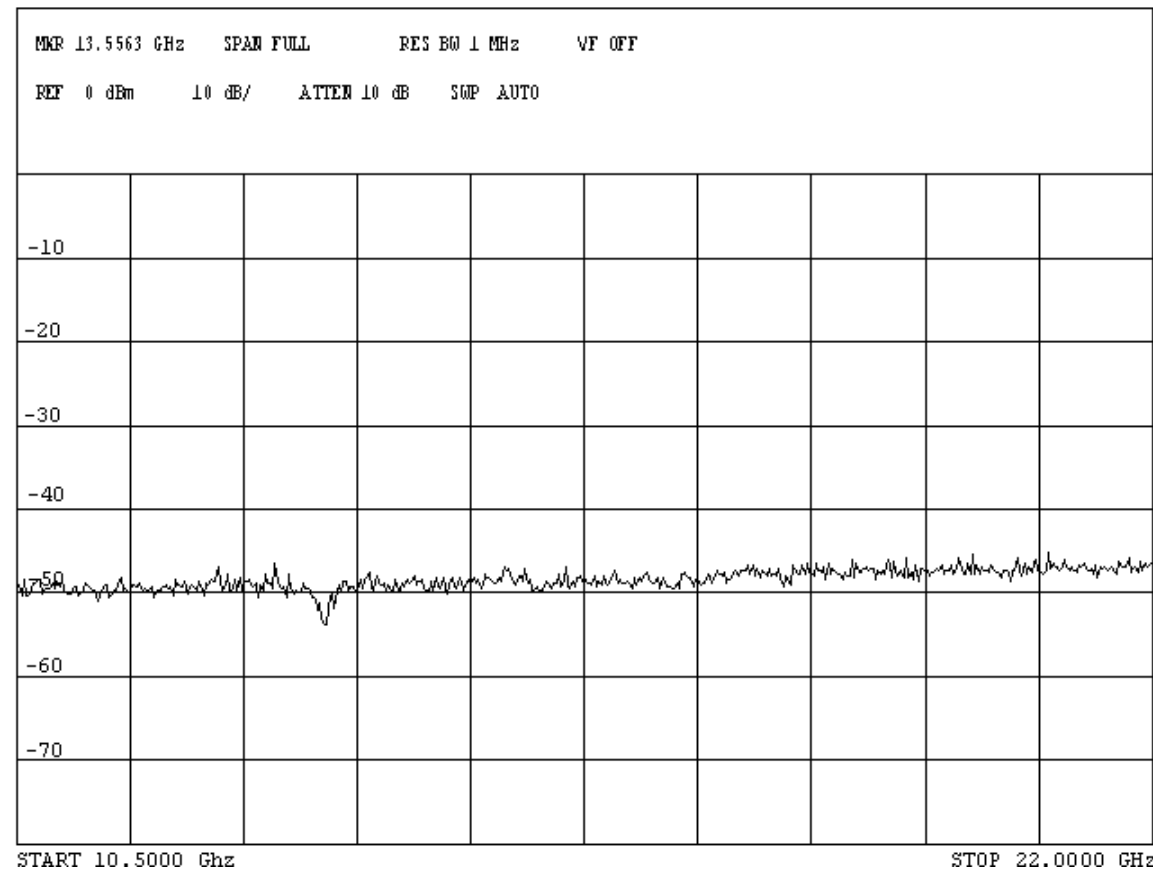
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Channel                                                  |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



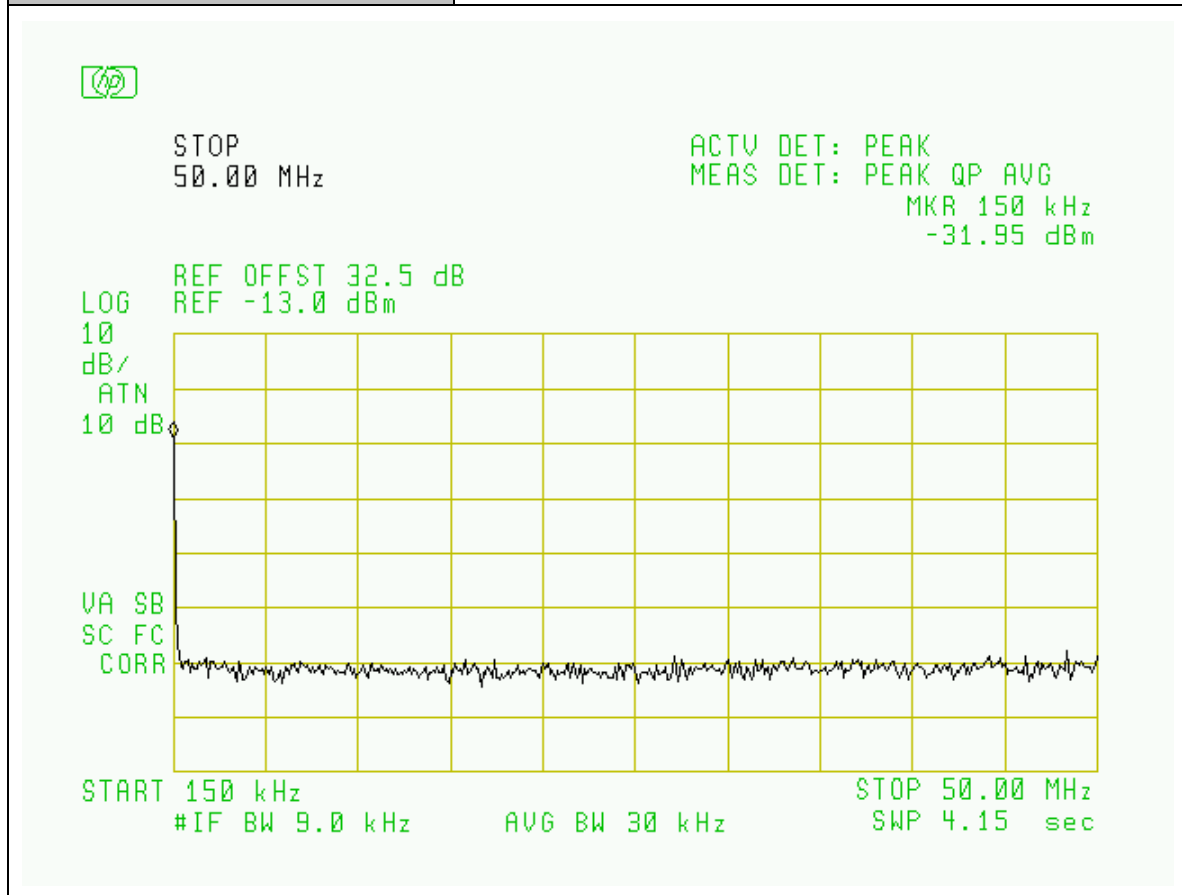
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Channel                                                  |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



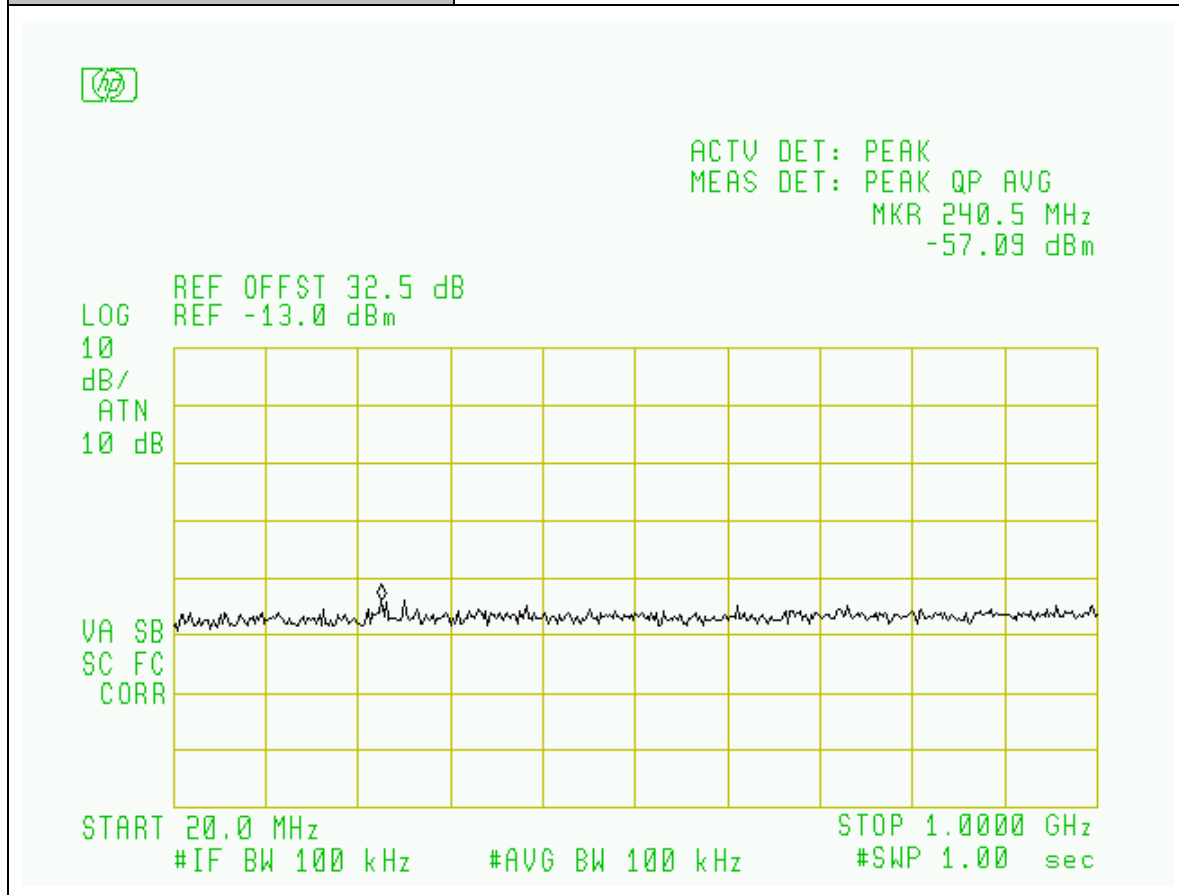
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Channel                                                 |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



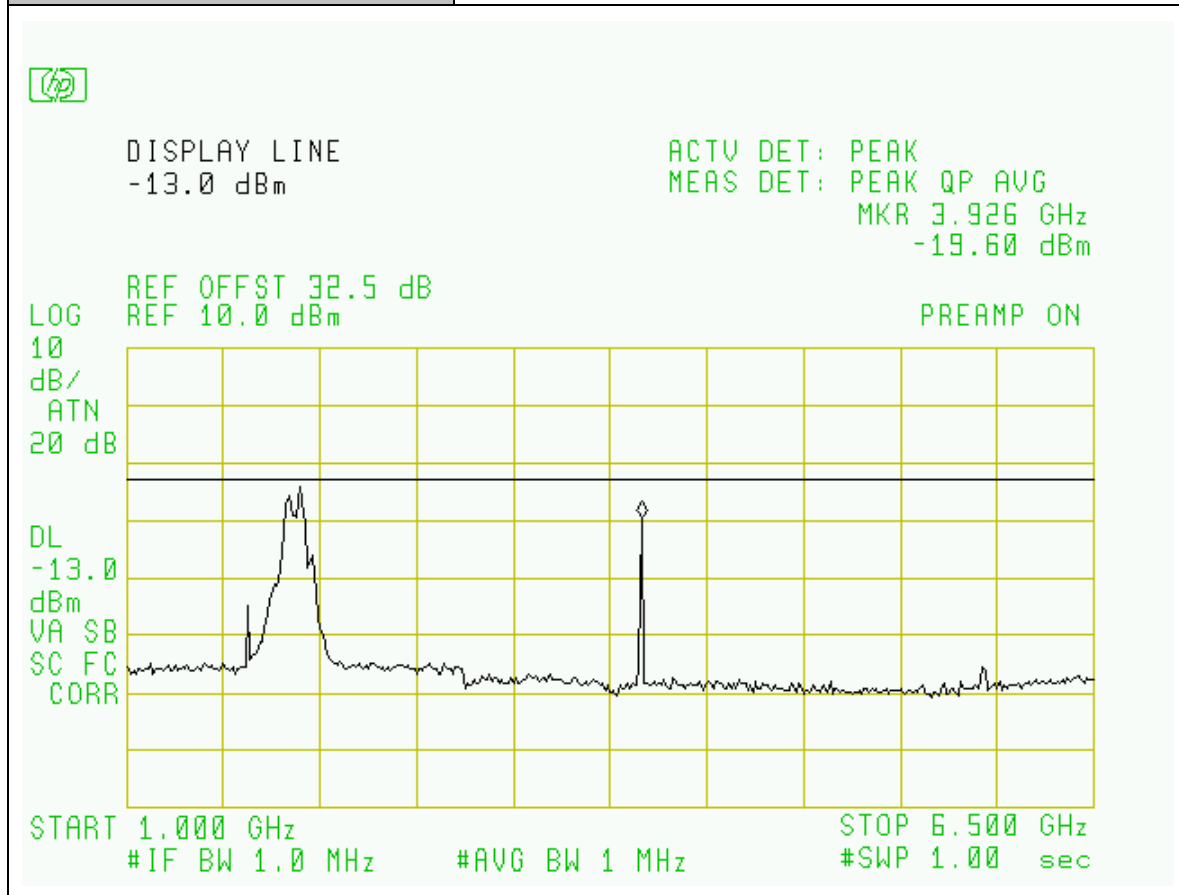
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Channel                                                 |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



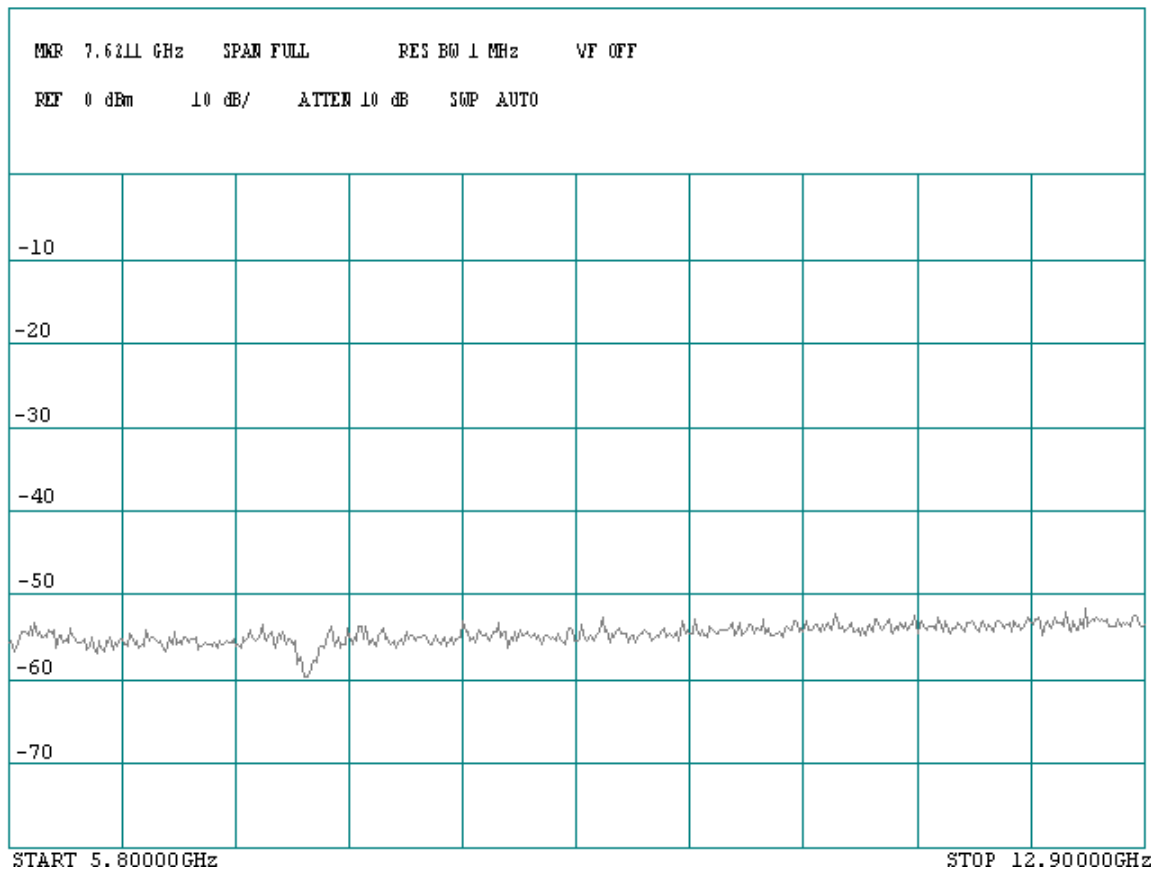
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Channel                                                 |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



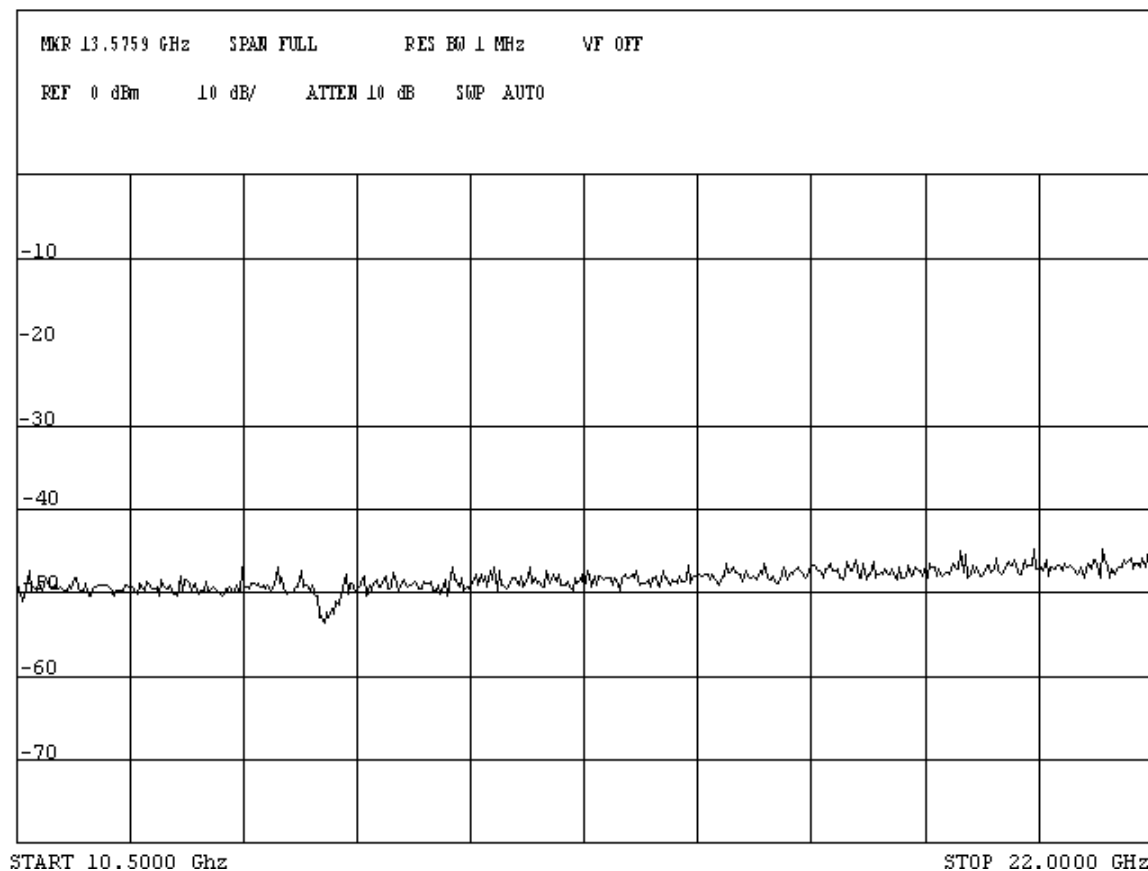
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Channel                                                 |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



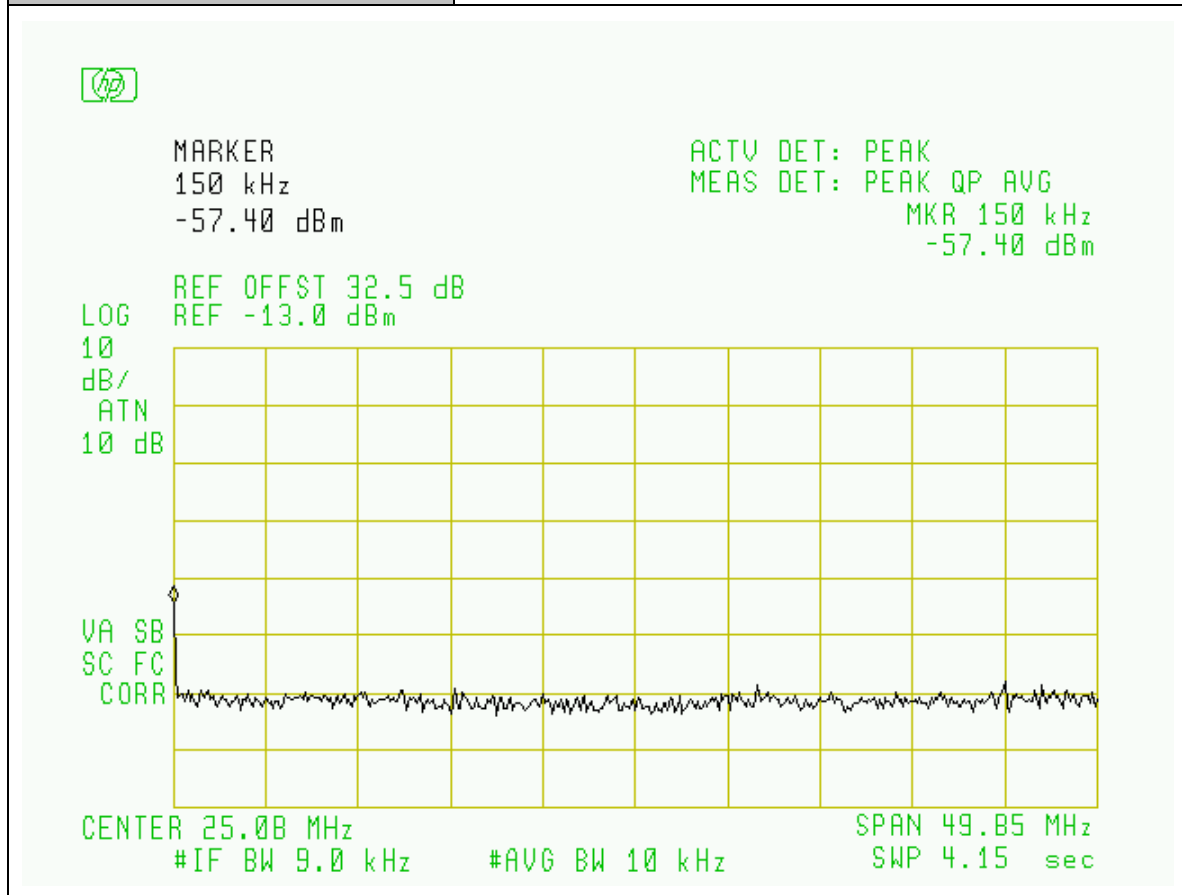
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Channel                                                 |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Channel                                                 |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



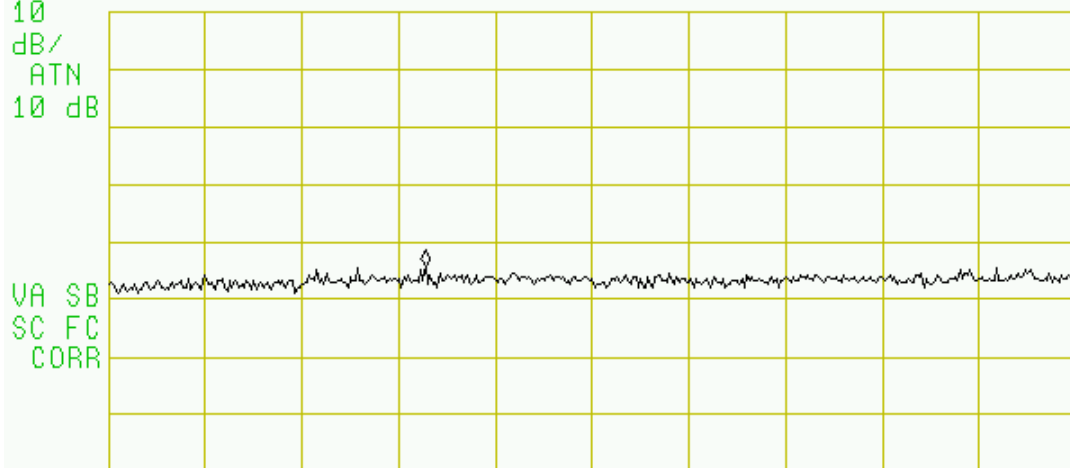
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Channel                                                 |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |

17:52:29 JUN 08, 2005

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 341.0 MHz  
-57.55 dBm

LOG REF OFFST 32.5 dB  
10 REF -13.0 dBm  
dB/  
ATN  
10 dB



START 20.0 MHz STOP 1.0000 GHz  
#IF BW 100 kHz #AVG BW 100 kHz #SWP 1.000 sec

|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70°F                                          |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                                                             |
|-----------------------|-------------------------------------------------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation                                       |
| <b>Plot Name:</b>     | Downlink, Low-Channel                                                                                       |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT<br>* 2 <sup>nd</sup> Harmonic Average Reading = -21.72dBm |

17:47:21 JUN 08, 2005

MARKER  
3.871 GHz  
-13.14 dBm

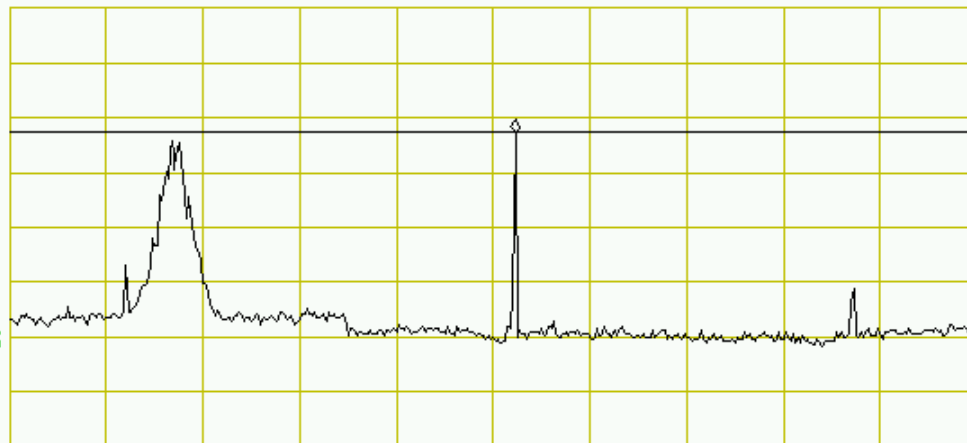
ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 3.871 GHz  
-13.14 dBm

REF OFFST 32.5 dB  
REF 10.0 dBm

PREAMP ON

LOG  
10  
dB/  
ATN  
20 dB

DL  
-13.0  
dBm  
VA SB  
SC FC  
CORR



START 1.000 GHz

#IF BW 1.0 MHz

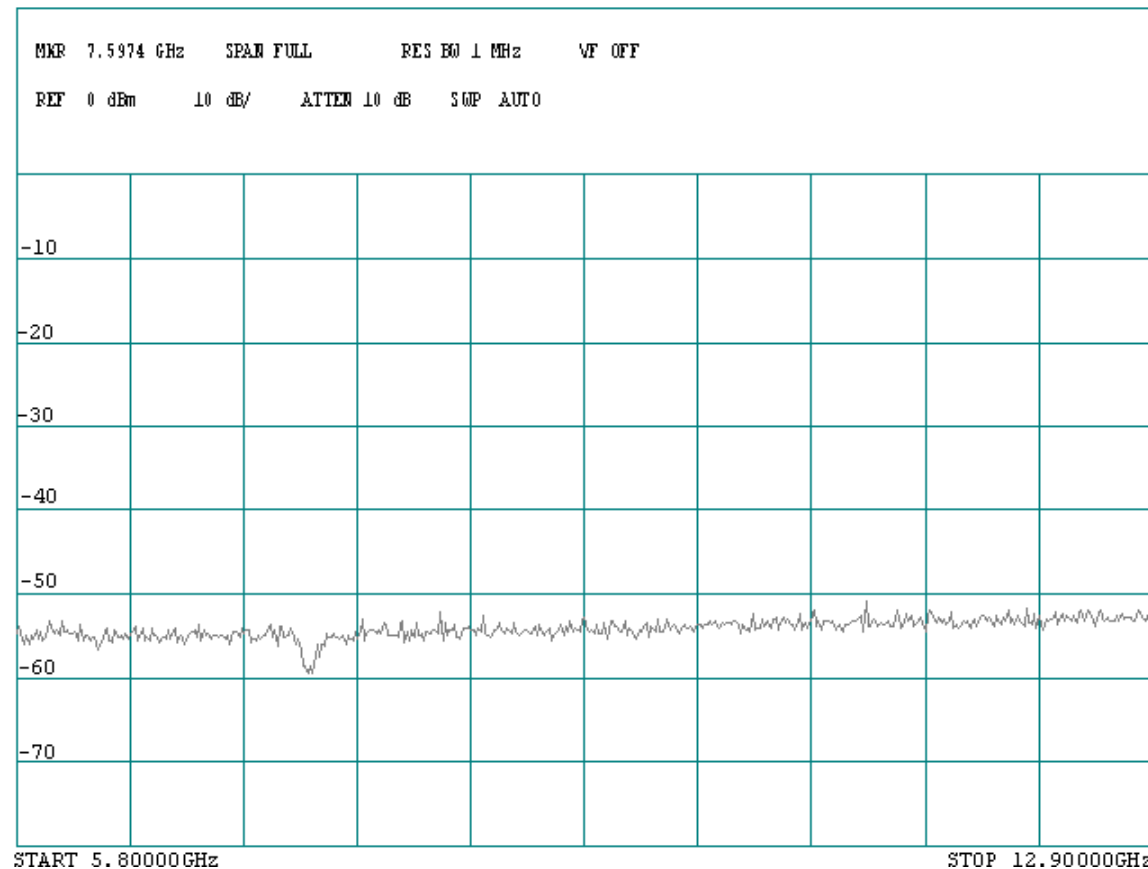
#AVG BW 1 MHz

STOP 6.500 GHz

#SWP 1.000 sec

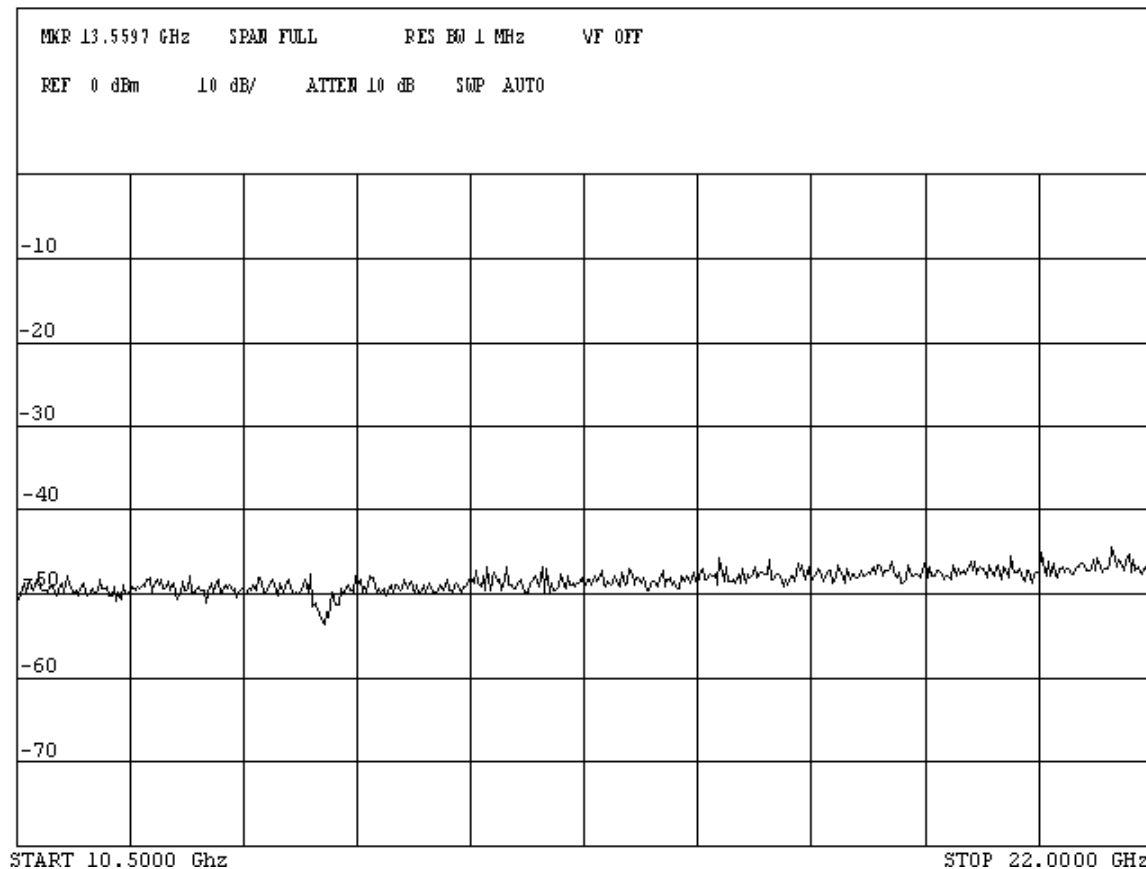
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Channel                                                 |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



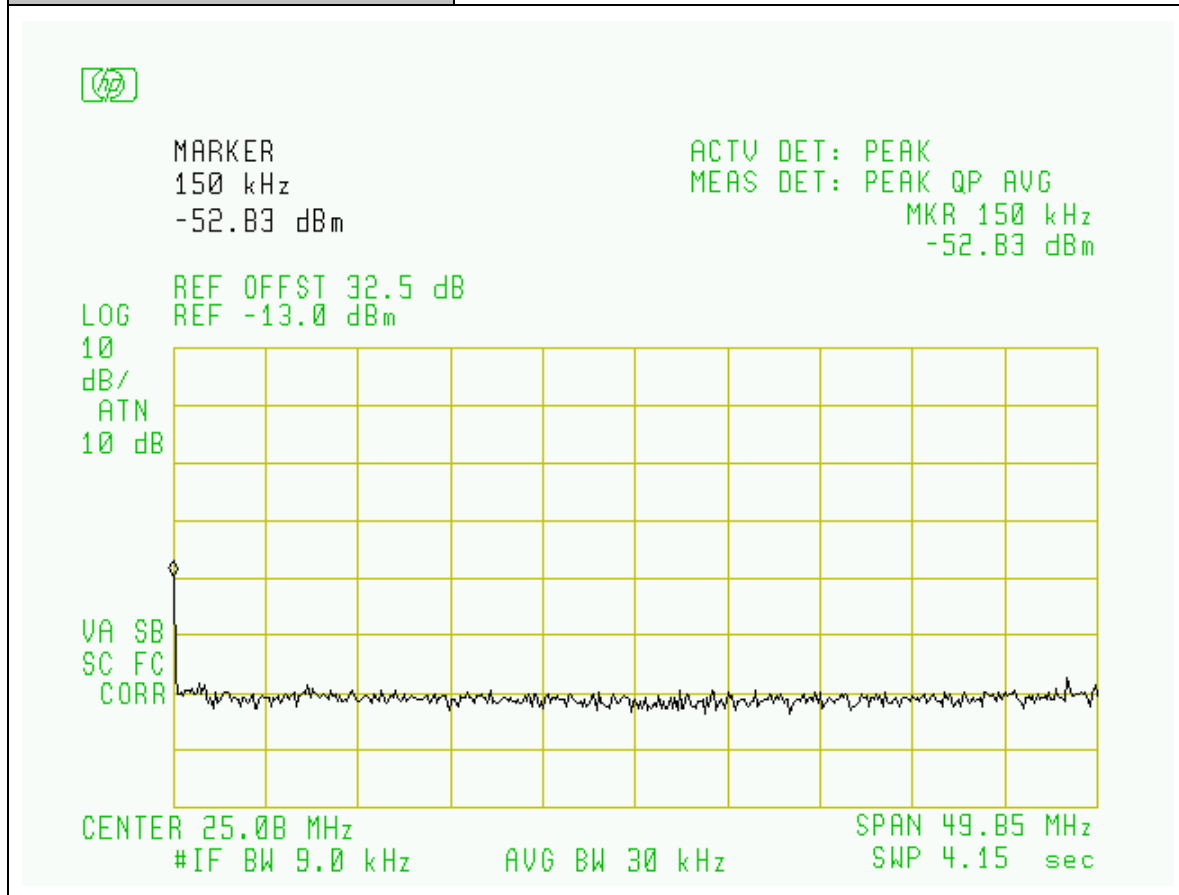
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Wei Li                                        |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / CDMA2000 Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Channel                                                 |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                     |



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Channel                                               |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Channel                                               |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |

18:54:13 JUN 08, 2005

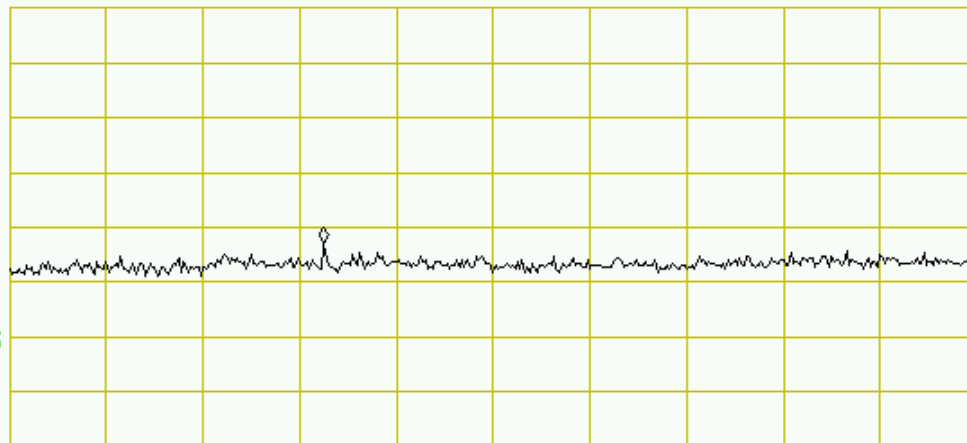
REF LEVEL  
-13.0 dBm

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 338.5 MHz  
-55.91 dBm

REF OFFST 32.5 dB  
REF -13.0 dBm

LOG  
10  
dB/  
ATN  
10 dB

UA SB  
SC FC  
CORR



START 20.0 MHz

#IF BW 100 kHz

#AVG BW 100 kHz

STOP 1.0000 GHz

#SWP 1.00 sec

|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Channel                                               |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |

18:56:39 JUN 08, 2005

DISPLAY LINE  
-13.0 dBm

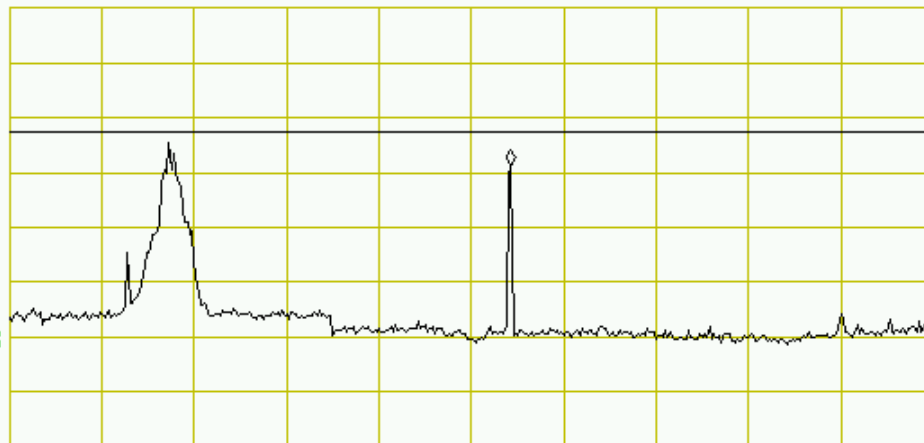
ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 3.981 GHz  
-19.05 dBm

REF OFFST 32.5 dB  
REF 10.0 dBm

PREAMP ON

LOG  
10  
dB/  
ATN  
20 dB

DL  
-13.0  
dBm  
VA SB  
SC FC  
CORR



START 1.000 GHz

#IF BW 1.0 MHz

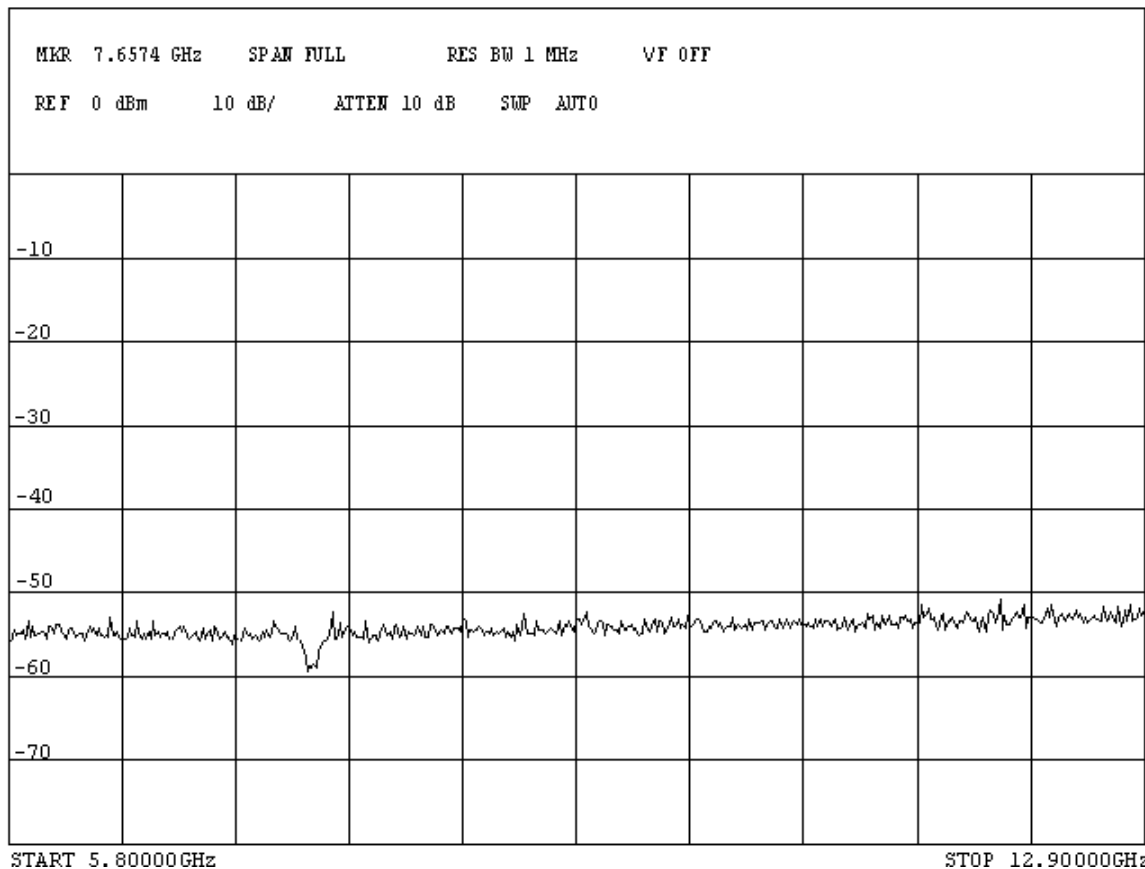
#AVG BW 1 MHz

STOP 6.500 GHz

#SWP 1.00 sec

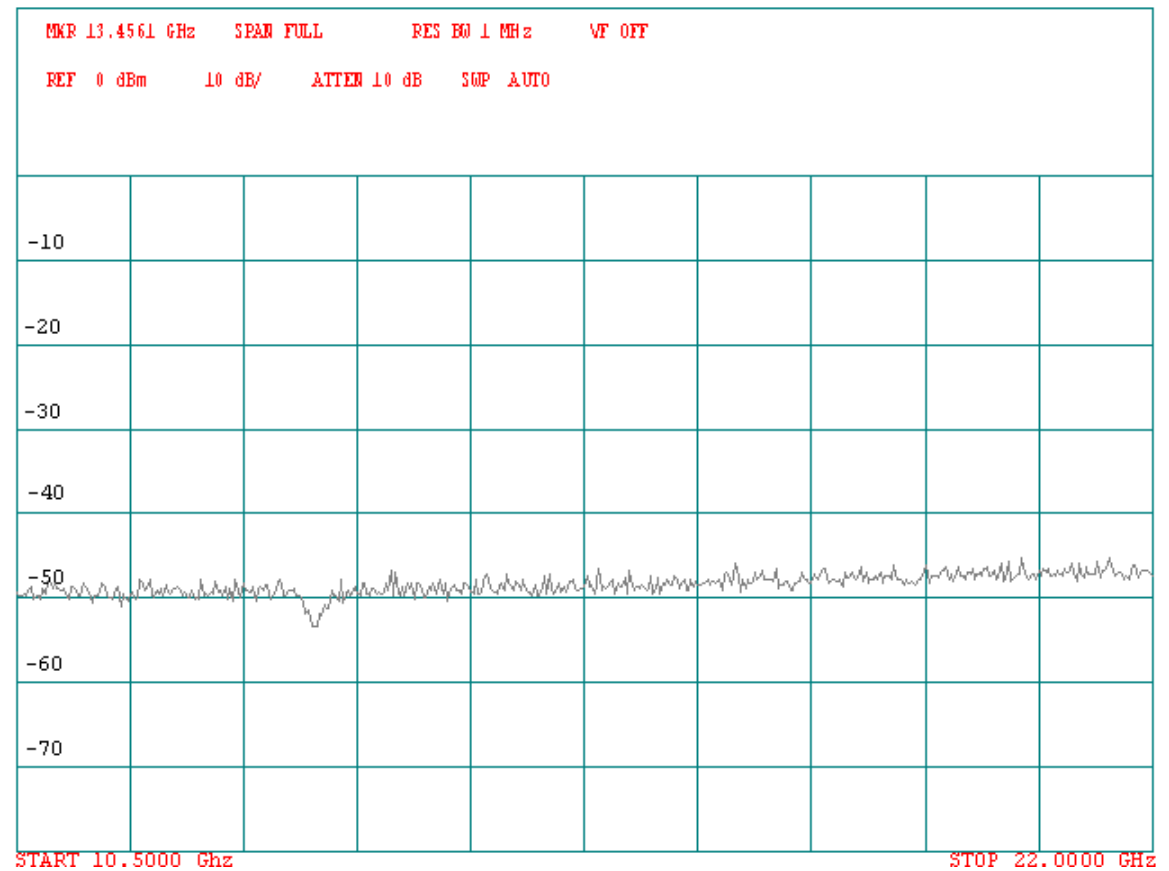
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Channel                                               |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Hi-Channel                                               |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Channel                                              |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |

18:44:55 JUN 08, 2005

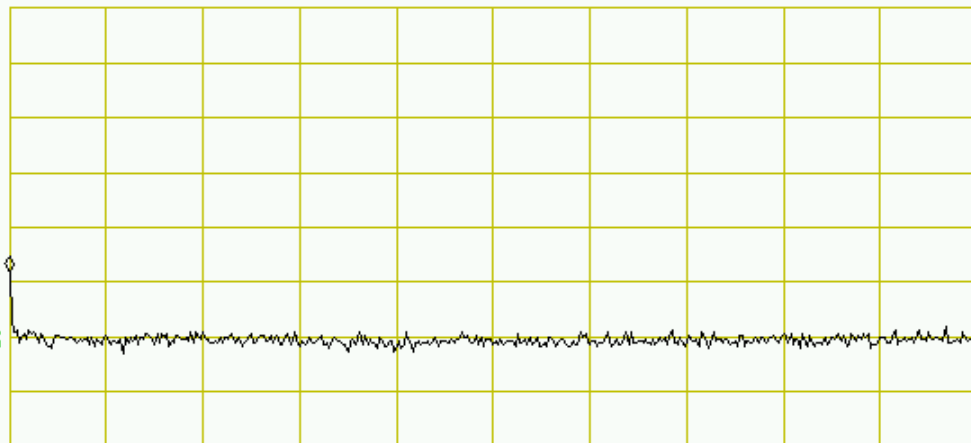
MARKER  
150 kHz  
-61.23 dBm

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 150 kHz  
-61.23 dBm

REF OFFST 32.5 dB  
REF -13.0 dBm

LOG  
10  
dB/  
ATN  
10 dB

VA SB  
SC FC  
CORR



CENTER 25.08 MHz

#IF BW 9.0 kHz

AVG BW 30 kHz

SPAN 49.85 MHz

SWP 4.15 sec

|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Channel                                              |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |

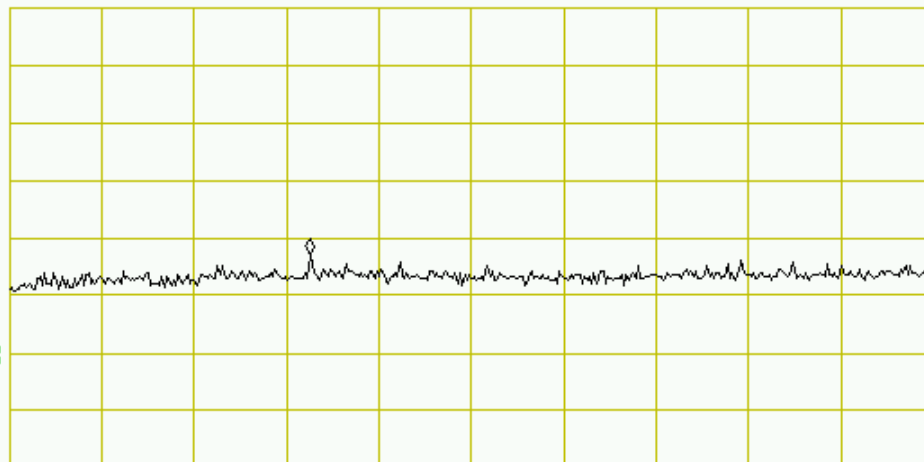
18:51:00 JUN 08, 2005

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 338.5 MHz  
-55.98 dBm

REF OFFST 32.5 dB  
REF -13.0 dBm

LOG  
10  
dB/  
ATN  
10 dB

VA SB  
SC FC  
CORR



START 20.0 MHz STOP 1.0000 GHz  
#IF BW 100 kHz #AVG BW 100 kHz #SWP 1.00 sec

|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Channel                                              |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |

18:50:01 JUN 08, 2005

MARKER  
3.926 GHz  
-23.55 dBm

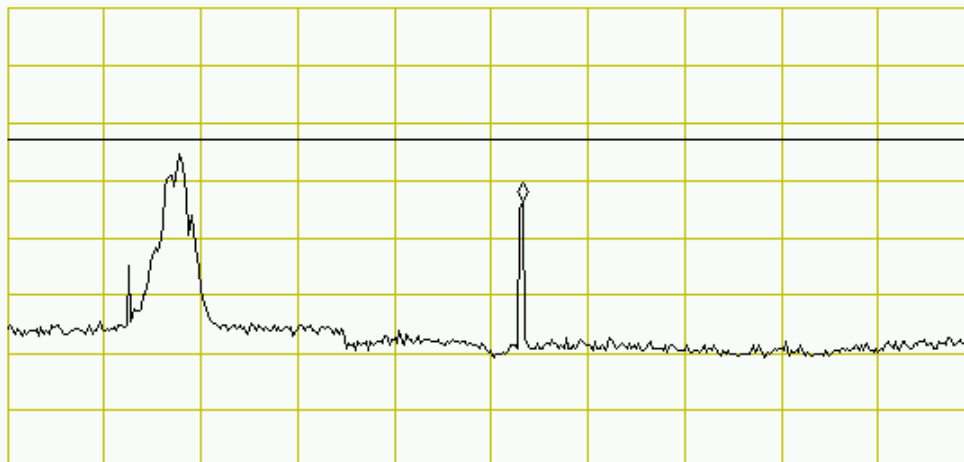
ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 3.926 GHz  
-23.55 dBm

REF OFFST 32.5 dB  
REF 10.0 dBm

PREAMP ON

LOG  
10  
dB/  
ATN  
20 dB

DL  
-13.0  
dBm  
VA SB  
SC FC  
CORR



START 1.000 GHz

#IF BW 1.0 MHz

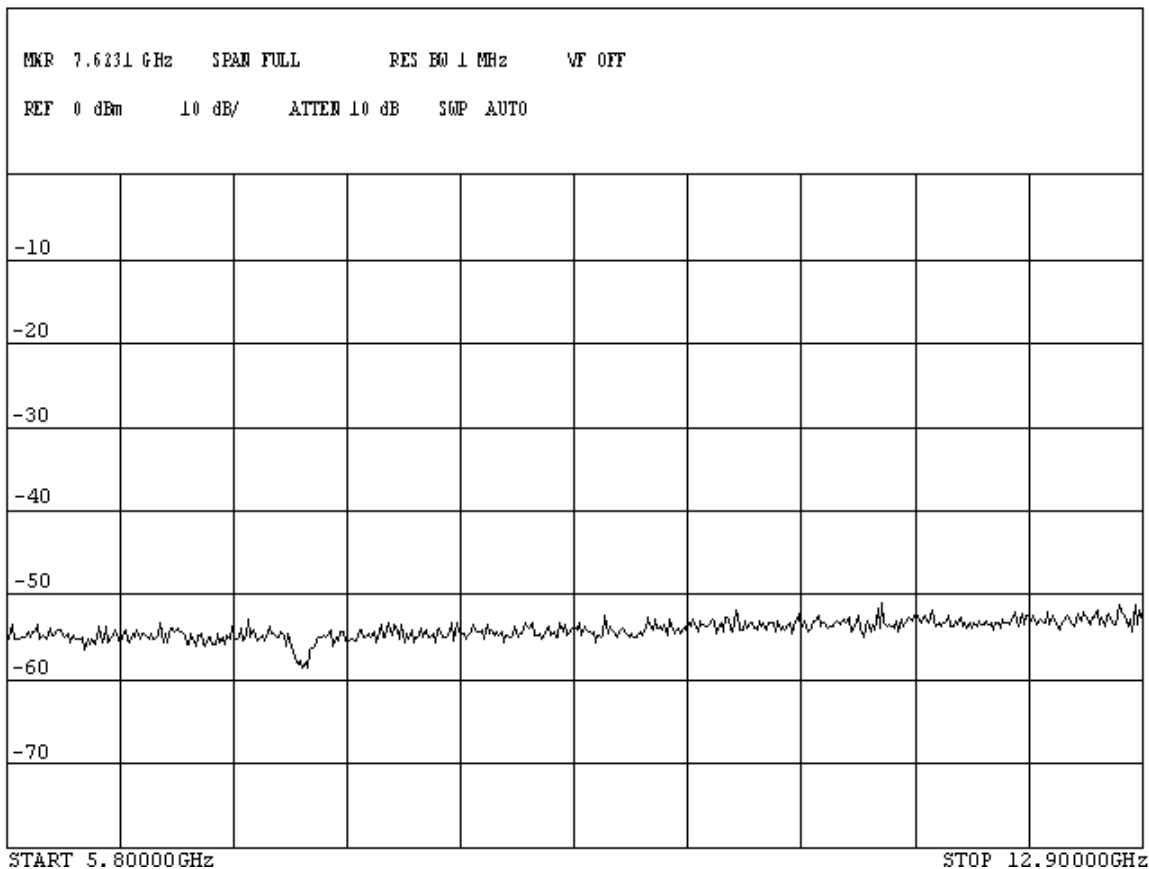
#AVG BW 1 MHz

STOP 6.500 GHz

#SWP 1.00 sec

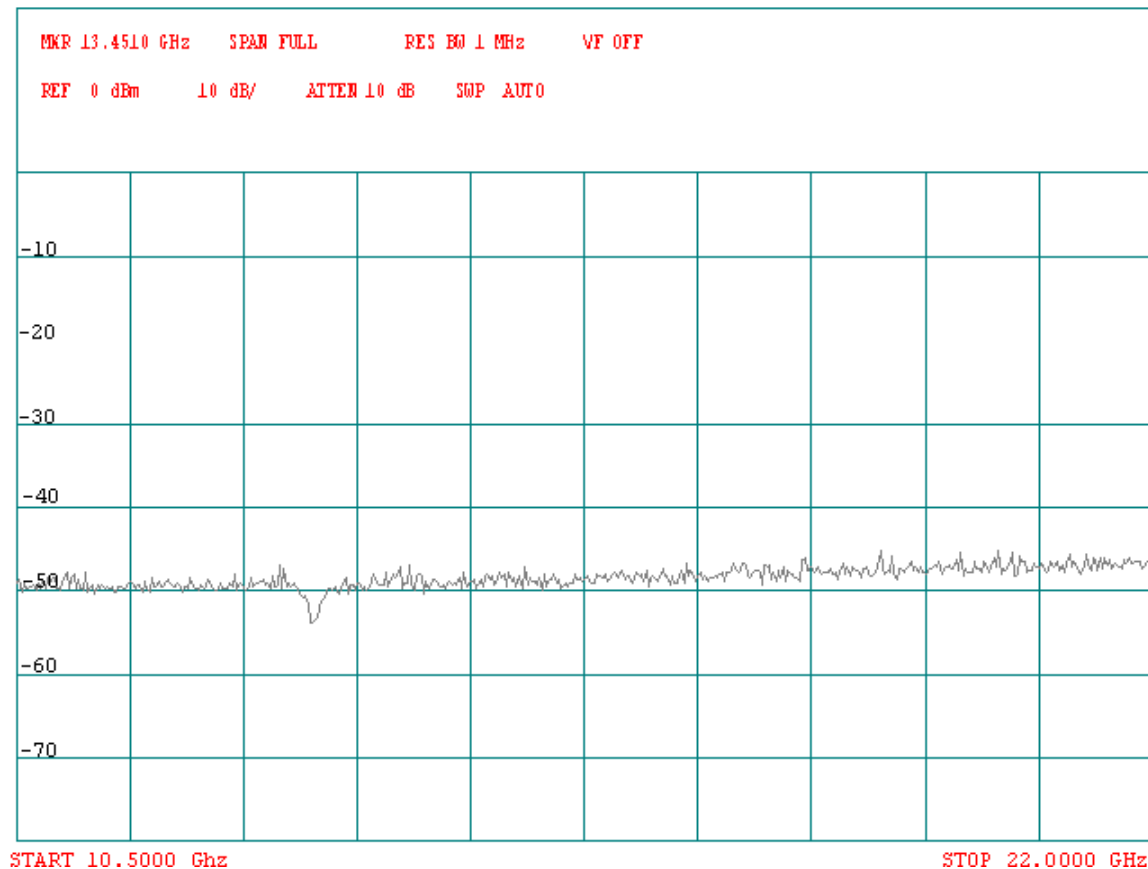
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Channel                                              |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |



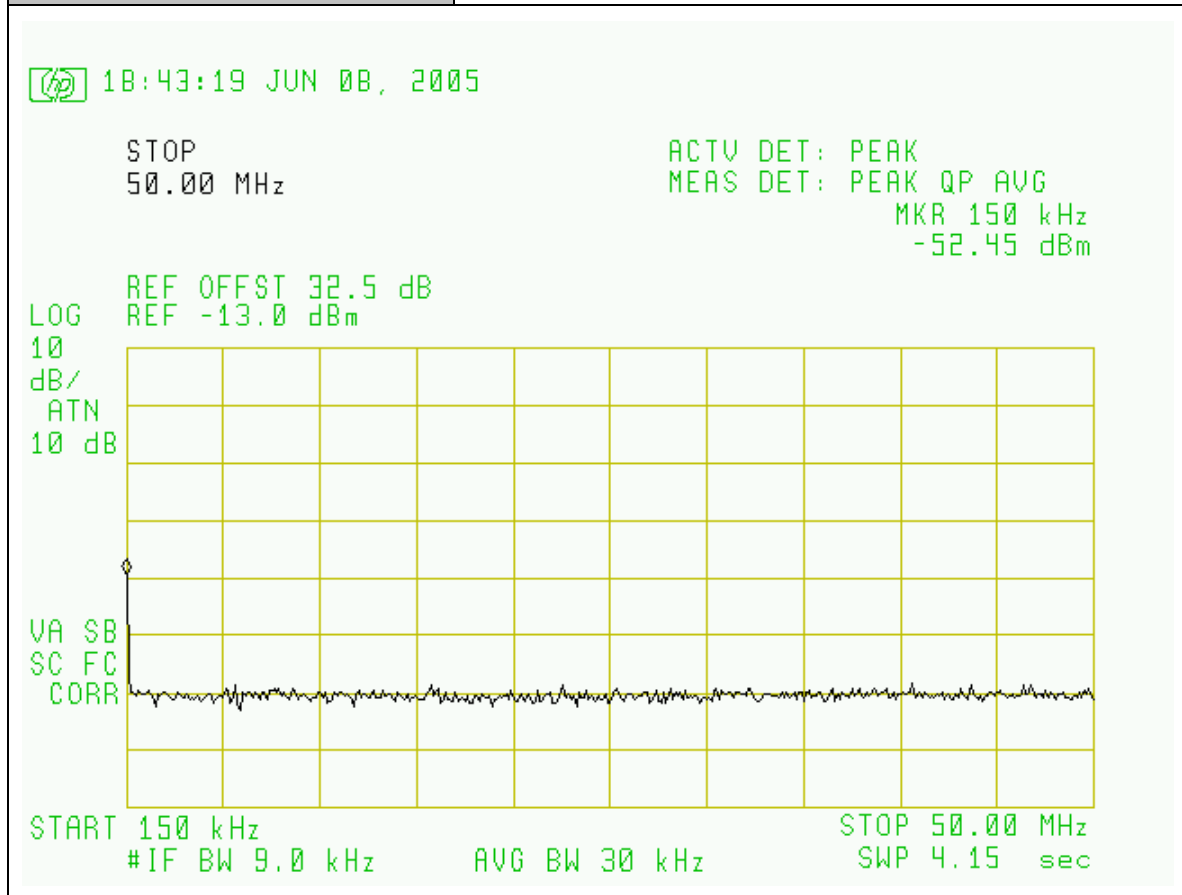
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Mid-Channel                                              |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Channel                                              |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Channel                                              |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |

18:41:59 JUN 08, 2005

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 492.9 MHz  
-57.05 dBm

LOG REF OFFST 32.5 dB  
10 REF -13.0 dBm

dB/  
ATN  
10 dB

VA SB  
SC FC  
CORR

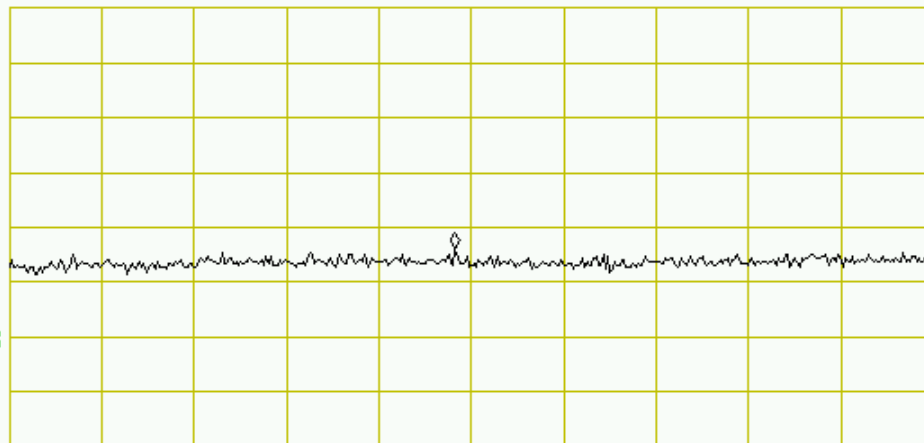
START 20.0 MHz

#IF BW 100 kHz

#AVG BW 100 kHz

STOP 1.0000 GHz

#SWP 1.00 sec



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Channel                                              |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |

18:20:35 JUN 08, 2005

DISPLAY LINE  
-13.0 dBm

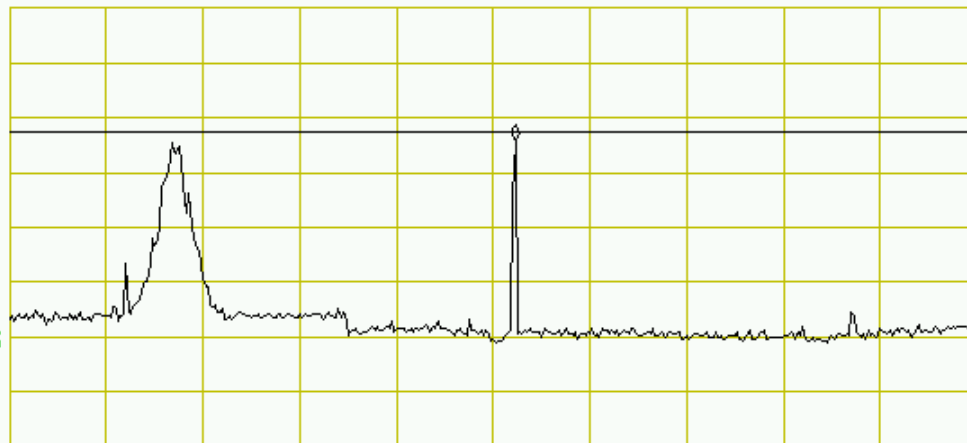
ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 3.871 GHz  
-14.43 dBm

REF OFFST 32.5 dB  
REF 10.0 dBm

PREAMP ON

LOG  
10  
dB/  
ATN  
20 dB

DL  
-13.0  
dBm  
VA SB  
SC FC  
CORR



START 1.000 GHz

#IF BW 1.0 MHz

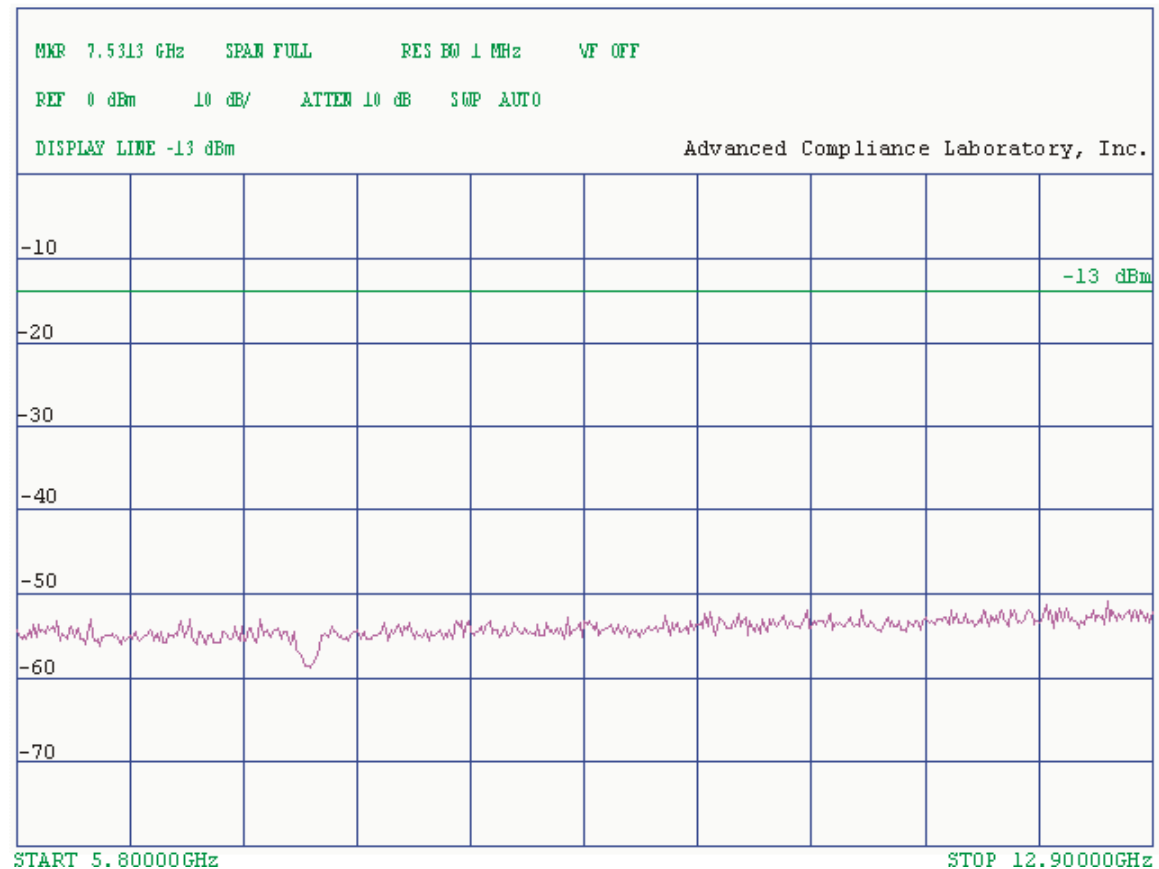
#AVG BW 1 MHz

STOP 6.500 GHz

#SWP 1.00 sec

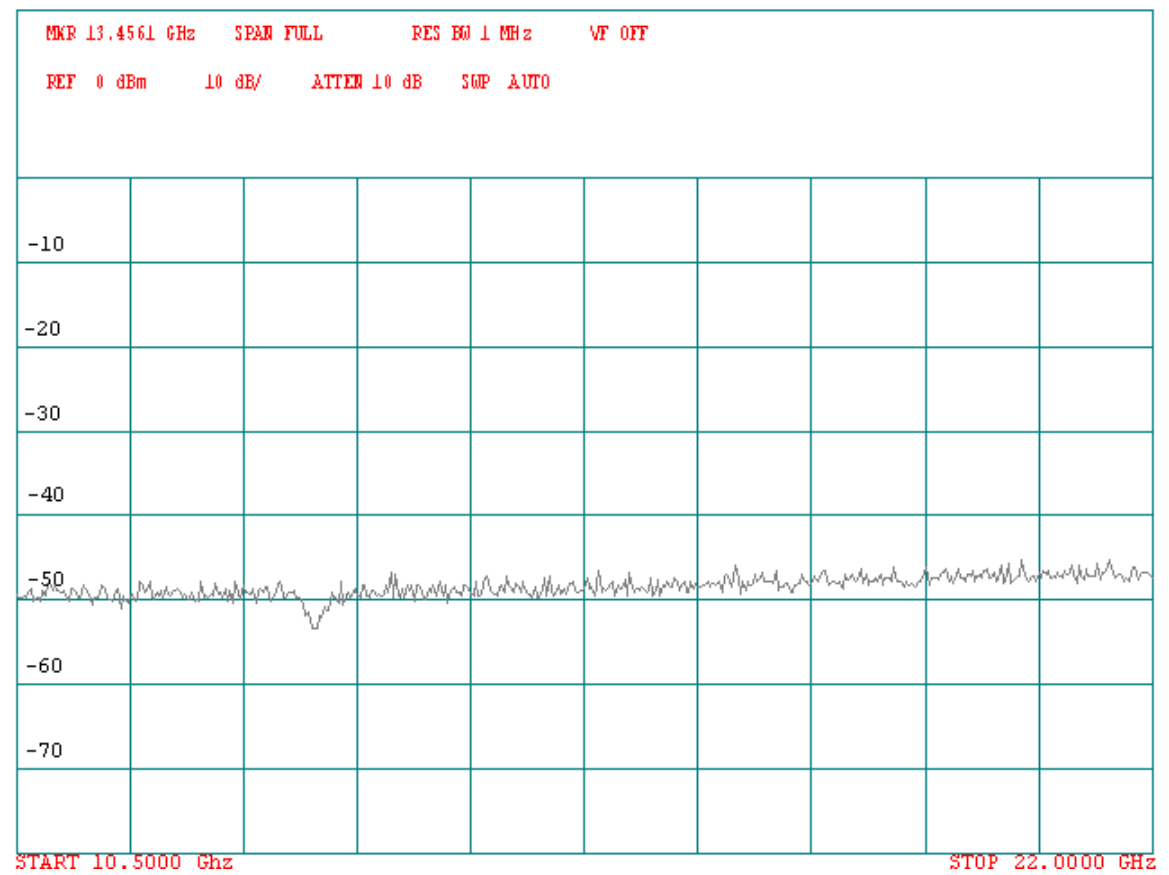
|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Channel                                              |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |



|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>Project Number:</b> | 0048-050606-01                                |
| <b>EUT:</b>            | ANDREW Digital Multi-Carrier Amplifier DMAU-U |
| <b>PARTS NO.:</b>      | RF100154                                      |
| <b>Tested By:</b>      | Edward Lee                                    |
| <b>Temperature:</b>    | 70° F                                         |
| <b>Humidity:</b>       | 30%                                           |

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| <b>Section:</b>       | Spurious Emissions at RF Output Port: PCS Bands / WCDMA Modulation |
| <b>Plot Name:</b>     | Downlink, Low-Channel                                              |
| <b>Configuration:</b> | Digital Input: -15dBm, Output Port: EUT RF OUTPUT                  |



**Section 6. Field Strength of Spurious**

|                      |                                   |                       |                       |
|----------------------|-----------------------------------|-----------------------|-----------------------|
| <b>Name of Test:</b> | <i>Field Strength of Spurious</i> | <b>Test Standard:</b> | 22.917<br>24.238      |
| <b>Tested By:</b>    | EDWARD LEE                        | <b>Test Date:</b>     | 06/02/2005-06/14/2005 |

**Minimum Standard:** Para. No. 22.917(e). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least  $43 + 10 \log P$ . This is equivalent to -13 dBm absolute power.  
Para. No. 24.238(a). The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a licensee's frequency block (-13dBm).

**Method of Measurement:** TIA/EIA-603-1992, Section 2.2.12  
The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting ERP is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

Per FCC Requirements, the antenna substitution method can be replaced by using following calculation to yield the required limit criteria WHEN the max. level of measured spurious emissions is 30dB below the limit.

### Calculation for Required Emission Limit Per 2.1053

With the DMAU RF output level set to 60 watts (47.78 dBm), Radiated Emissions between 10 MHz and 20 GHz shall be observed. The “Low, Mid, and High” frequencies shall be used for this test.

The Emission Limits and measuring instrumentation settings established in FCC Part 24.238 shall be followed. Emissions shall be less than  $43 + 10 \log (P)$  dBc. Per FCC Part 2.1053(a), “Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter (*amplifier*), assuming all emissions are radiated from half-wave dipole antennas.” The following relationships yield the required limit criteria.

For a half-wave dipole antenna in free space:

$$E = (49.2 * P)^{1/2} / R \quad [18.11 \text{ V/m}]$$

Where:

E = Field intensity in Volts/meter of carrier

P = transmitted power in Watts (60 W)

R = Distance from antenna to UUT in meters (3 meters)

Conversion of E, Volts/meter to dBuV/m:

$$20 \log (E * 10^6) \quad [145.16 \times 10^6]$$

$$\text{Attenuation requirement (Atten): } 43 + 10 \log P \quad [60.78]$$

Thus, the required limit:

$$E_{\text{lim}} = E - \text{Atten} \quad \text{dBuV/m}$$

For DMAU:

$$E = 145.16 \text{ dBuV/m (at 3 meters)}$$

$$\text{Atten} = 60.78 \text{ dBc}$$

Then,  $E_{\text{lim}} = 84.38 \text{ dBuV/m}$

Note: Emissions less than 64.38 dBuV/m (84.38 - 20 dB) may not be reported.

**Test Result:**

**Complies**

**Test Data:**

See Attached Table(s)

|                      |                                  |
|----------------------|----------------------------------|
| <b>Configuration</b> | PCS w/ RF Output Port Terminated |
| <b>Band</b>          | PCS Downlink                     |
| <b>Channel</b>       | Low                              |

| Freq. (MHz) | H,V | SA Reading (dBuV) | Height (m) | Angle (degree) | Calculated 3m Limit (dBuV) | Margin (dB) | Absolute Limit (dBm) | Margin (dB) |
|-------------|-----|-------------------|------------|----------------|----------------------------|-------------|----------------------|-------------|
| CDMA2000    |     |                   |            |                |                            |             |                      |             |
| 3862.5      | H   | 60.9              | 1.0        | 200            | 84.38                      | -23.48      | -13                  | -33.1       |
| 57937.5     | H   | 48.0              | 1.0        | 200            | 84.38                      | -36.38      | -13                  | -46         |
| 3862.5      | V   | 61.0              | 1.1        | 190            | 84.38                      | -23.38      | -13                  | -33         |
| 57937.5     | V   | 46.2*             | 1.1        | 190            | 84.38                      | -38.18      | -13                  | -47.8       |
| WCDMA       |     |                   |            |                |                            |             |                      |             |
| 3864.8      | H   | 63.0              | 1.0        | 200            | 84.38                      | -21.38      | -13                  | -31         |
| 5797.2      | H   | 49.2              | 1.0        | 200            | 84.38                      | -35.18      | -13                  | -44.8       |
| 3864.8      | V   | 59.5              | 1.1        | 190            | 84.38                      | -24.88      | -13                  | -34.5       |
| 5797.2      | V   | 47.0              | 1.1        | 190            | 84.38                      | -37.38      | -13                  | -47         |

**NOTE:**

\* Measured noise floor

SA: Spectrum Analyzer

H=horizontal and V=vertical

SA Reading: Peak Reading

|                      |                                  |
|----------------------|----------------------------------|
| <b>Configuration</b> | PCS w/ RF Output Port Terminated |
| <b>Band</b>          | PCS Downlink                     |
| <b>Channel</b>       | Mid                              |

| Freq. (MHz) | H,V | SA Reading (dBuV) | Height (m) | Angle (degree) | Calculated 3m Limit (dBuV) | Margin (dB) | Absolute Limit (dBm) | Margin (dB) |
|-------------|-----|-------------------|------------|----------------|----------------------------|-------------|----------------------|-------------|
| CDMA2000    |     |                   |            |                |                            |             |                      |             |
| 3920        | H   | 63.6              | 1.0        | 190            | 84.38                      | -20.78      | -13                  | -30.4       |
| 5880        | H   | 56.7              | 1.0        | 190            | 84.38                      | -27.68      | -13                  | -37.3       |
| 3920        | V   | 63.5              | 1.1        | 190            | 84.38                      | -20.88      | -13                  | -30.5       |
| 5880        | V   | 54.0              | 1.1        | 190            | 84.38                      | -30.38      | -13                  | -40         |
| WCDMA       |     |                   |            |                |                            |             |                      |             |
| 3920        | H   | 62.5              | 1.0        | 190            | 84.38                      | -21.88      | -13                  | -31.5       |
| 5880        | H   | 53.3              | 1.0        | 190            | 84.38                      | -31.08      | -13                  | -40.7       |
| 3920        | V   | 61.7              | 1.1        | 190            | 84.38                      | -22.68      | -13                  | -32.3       |
| 5880        | V   | 47.8              | 1.1        | 190            | 84.38                      | -36.58      | -13                  | -46.2       |

**NOTE:**

\* Measured noise floor

SA: Spectrum Analyzer

H=horizontal and V=vertical

SA Reading: Peak Reading

|                      |                                  |
|----------------------|----------------------------------|
| <b>Configuration</b> | PCS w/ RF Output Port Terminated |
| <b>Band</b>          | PCS Downlink                     |
| <b>Channel</b>       | High                             |

| Freq. (MHz) | H,V | SA Reading (dBuV) | Height (m) | Angle (degree) | Calculated 3m Limit (dBuV) | Margin (dB) | Absolute Limit (dBm) | Margin (dB) |
|-------------|-----|-------------------|------------|----------------|----------------------------|-------------|----------------------|-------------|
| CDMA2000    |     |                   |            |                |                            |             |                      |             |
| 3977.5      | H   | 59.7              | 1.0        | 200            | 84.38                      | -24.68      | -13                  | -34.3       |
| 5966.3      | H   | 44.0*             | 1.0        | 200            | 84.38                      | -40.38      | -13                  | -50         |
| 3975.2      | V   | 55.3              | 1.1        | 190            | 84.38                      | -29.08      | -13                  | -38.7       |
| 5962.8      | V   | 43.9*             | 1.1        | 190            | 84.38                      | -40.48      | -13                  | -50.1       |
| WCDMA       |     |                   |            |                |                            |             |                      |             |
| 3977.5      | H   | 60.0              | 1.0        | 200            | 84.38                      | -24.38      | -13                  | -34         |
| 5966.3      | H   | 47.9              | 1.0        | 200            | 84.38                      | -36.48      | -13                  | -46.1       |
| 3975.2      | V   | 54.5              | 1.1        | 190            | 84.38                      | -29.88      | -13                  | -39.5       |
| 5962.8      | V   | 46.8*             | 1.1        | 190            | 84.38                      | -37.58      | -13                  | -47.2       |

**NOTE:**

\* Measured noise floor

SA: Spectrum Analyzer

H=horizontal and V=vertical

SA Reading: Peak Reading

**Section 7. Frequency Stability**

|                      |                                   |                       |                                            |
|----------------------|-----------------------------------|-----------------------|--------------------------------------------|
| <b>Name of Test:</b> | <b><i>Frequency Stability</i></b> | <b>Test Standard:</b> | <b><i>2.1055<br/>22.355&amp;24.235</i></b> |
| <b>Tested By:</b>    | <b>WEI LI</b>                     | <b>Test Date:</b>     | <b>06/02-06/14/2005</b>                    |

**Minimum Standard:** Para. No. 22.355. The transmitter carrier frequency shall remain within the tolerances given in Table C-1.

TABLE C-1.—FREQUENCY TOLERANCE FOR TRANSMITTERS IN THE PUBLIC MOBILE SERVICES

| Frequency range (MHz) | Base, fixed (ppm) | Mobile ≤3 watts (ppm) | Mobile ≤3 watts (ppm) |
|-----------------------|-------------------|-----------------------|-----------------------|
| 25 to 50 .....        | 20.0              | 20.0                  | 50.0                  |
| 50 to 450 .....       | 5.0               | 5.0                   | 50.0                  |
| 450 to 512 .....      | 2.5               | 5.0                   | 5.0                   |
| 821 to 896 .....      | 1.5               | 2.5                   | 2.5                   |
| 928 to 929 .....      | 5.0               | n/a                   | n/a                   |
| 929 to 960 .....      | 1.5               | n/a                   | n/a                   |
| 2110 to 2220 .....    | 10.0              | n/a                   | n/a                   |

Para No. 24.235. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

**Method of Measurement:** Frequency Stability With Voltage Variation:  
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +25 degrees Celsius for at least 15 minutes. Set SA resolution bandwidth low enough (30Hz) to obtain the desired frequency resolution. (Using frequency counter method: The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10MHz ref, in of the signal generator). With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation:  
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

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**Test Result:**

**Complies**

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**Test Data:**

See Attached Table(s)

PCS Bands

Frequency Tolerance Specification: 0.05ppm (98Hz)

Frequency Stability versus Environmental Temperature

| Reference Frequency @ 26V & +25°C:<br>Downlink: <u>1.960001</u> GHz |  |                     |
|---------------------------------------------------------------------|--|---------------------|
| Temperature & Direction<br>(°C)                                     |  | Deviation *<br>(Hz) |
| -40                                                                 |  | 1.19                |
| -30                                                                 |  | 2.11                |
| -20                                                                 |  | 0.81                |
| -10                                                                 |  | 0.78                |
| 0                                                                   |  | 0.38                |
| +10                                                                 |  | 1.85                |
| +20                                                                 |  | 1.22                |
| +30                                                                 |  | 0.95                |
| +40                                                                 |  | 0.84                |
| +50                                                                 |  | 1.12                |

\*10 samples per temp plateau to achieve max.

Frequency Stability versus DC Voltage (EUT +25°C operating frequency as reference)

| Reference Frequency @ 26VDC & +25°C:<br>Downlink: <u>1.960001</u> GHz |  |                   |
|-----------------------------------------------------------------------|--|-------------------|
| Voltage & Direction<br>(DC)                                           |  | Deviation<br>(Hz) |
| 22.1                                                                  |  | 0.95              |
| 29.9                                                                  |  | 0.95              |

**Section 8. Out of Band Rejection**

|                      |                              |                       |                       |
|----------------------|------------------------------|-----------------------|-----------------------|
| <b>Name of Test:</b> | <i>Out of Band Rejection</i> | <b>Test Standard:</b> |                       |
| <b>Tested By:</b>    | Edward Lee                   | <b>Test Date:</b>     | 06/02/2005-06/14/2005 |

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|                          |                                                                                                                                                                                                                                                                |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Minimum Standard:</b> | The passband gain shall not exceed the nominal gain by more than 1.0 dB. The 20 dB bandwidth shall not exceed the nominal bandwidth that is stated by the manufacturer. Outside of the 20 dB bandwidth, the gain shall not exceed the gain at the 20 dB point. |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Method of Measurement:</b> | Adjust the internal gain control of the equipment under test to the nominal gain for which equipment certification is sought.<br>With the aid of a signal generator and spectrum analyzer, measure the 20 dB bandwidth of the amplifier (i.e. at the point where the gain has fallen by 20 dB). Measure the gain-versus-frequency response of the amplifier from the midband frequency $f_0$ of the passband up to at least $f_0 \pm 250\%$ of the 20 dB bandwidth. |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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**Test Result:****Complies**

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**Test Data:**

See Attached Table(s)

PER PRODUCT DESIGN & OPERATION CRITERIA ON DIGITAL INPUTS, THIS SYSTEM HAS NO AMPLIFYING FUNCTION FOR OUT-BAND SIGNALS.

**Section 9. Test Equipment List**

| <b>Manufacture</b> | <b>Model</b>     | <b>Serial No.</b> | <b>Description</b>                    | <b>Last Cal<br/>dd/mm/<br/>yy</b> | <b>Cal Due<br/>dd/mm/<br/>yy</b> |
|--------------------|------------------|-------------------|---------------------------------------|-----------------------------------|----------------------------------|
| HP                 | HP8546A          | 3448A00290        | EMI Receiver                          | 12/01/05                          | 12/01/06                         |
| HP                 | E4432B           | US38220355        | 250K-3GHz Signal Generator            | 17/09/03                          | 17/09/05                         |
| EMCO               | 3104C            | 9307-4396         | 20-300MHz Biconical Antenna           | 12/02/05                          | 12/02/06                         |
| EMCO               | 3146             | 9008-2860         | 200-1000MHz Log-Periodic Antenna      | 09/02/05                          | 09/02/06                         |
| Fischer Custom     | LIPARTS<br>NO.-2 | 900-4-0008        | Line Impedance Stabilization Networks | 23/08/04                          | 23/08/05                         |
| Fischer Custom     | LIPARTS<br>NO.-2 | 900-4-0009        | Line Impedance Stabilization Networks | 23/08/04                          | 23/08/05                         |
| EMCO               | 6502             | 2665              | 10KHz-30MHz Active Loop Antenna       | 27/02/05                          | 27/02/06                         |
| EMCO               | 3115             | 4945              | Double Ridge Guide Horn Antenna       | 11/08/04                          | 11/08/05                         |
| HP                 | 8569B            | 2607A02802        | 1GHz-22GHz Spectrum Analyzer          | 10/02/05                          | 10/02/06                         |
| Delta Design       | 5900C            | 0-67-26           | Temperature Chamber                   | 24/03/05                          | 24/03/06                         |
| HP                 | E8254A           | US42110367        | Signal Generator                      | 23/03/05                          | 23/03/06                         |
| Electro-Metrics    | RGA-15           | 8-95              | Double Ridge Guide Horn Antenna       | 10/02/05                          | 10/02/06                         |
| EMCO               | 3116             | 4943              | Double Ridge Guide Horn Antenna       | 11/01/05                          | 11/01/06                         |
| Scientific-Atlanta | 12A-18           | 441               | Wave Guide Horn Antenna               | 04/08/04                          | 04/08/05                         |
| HP                 | 4419A            | US37292112        | RF Power Meter w/ Sensor Probe        | 20/07/04                          | 20/07/05                         |
| Chamber            | GD-32-33         | LN2               | Temperature Chamber                   | 20/07/04                          | 20/07/05                         |
| RES-NET            | RFA500NFF<br>30  | 0108              | 30dB in-line Power Attenuator         |                                   |                                  |
| Narda              | 3022             | 80986             | Directional Coupler                   |                                   |                                  |
| General Purpose    |                  |                   | 0-60V, 50A DC Power Supply            |                                   |                                  |